LEAFLETS

OF

PHILIPPINE BOTANY

Edited by A. D. E. ELMER, A. M.

Volume X, articles 130-137 (Plate I)

Including a statement regarding my type specimens:— contents of volumes, number of articles, pages and years:— list of authors, names of articles with citations:— general index (in preparation).

1938-1939

B. 12.50

Subscription Price 3 Cents Per Page
Manila, Philippine Islands

MISSOURI BOTANICAL
RECEIVED
JUL 17 1940
GARDEN LIBRARY.

14

CONTENTS — VOL. X

Article		Page
130	Glumaceae of the Irosin Valley by *A. D. E. Elmer*	3601
131	Notes on Asclepiadaceae by *A. D. E. Elmer*	3543
132	Irosin Freycinetia by *A. D. E. Elmer*	3507
133	Irosin Araceae by *A. D. E. Elmer*	3611
134	Irosin Schefflera by *A. D. E. Elmer*	3637
135	Irosin Melastomataceae by *A. D. E. Elmer*	3649
136	Miscellaneous New Species by *A. D. E. Elmer*	3673
137	Pandanus Utilissimus Elmer (Plate I) by *A. D. E. Elmer*	3811
	Errata	3819
	Index	3821
	Statement regarding my type specimens	3831
	Contents of volumes, number of articles, pages and years	3833
	List of authors, names of articles with citations	3835
	General index (in preparation).	

rec'd. 11-2-40.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. X Manila, P. I., March 15, 1938 Art. 130

GLUMACEAE OF THE IROSIN VALLEY

by

A. D. E. ELMER

—x—

Since many years ago after reading *Dr. E. D. Merrill's* first paragraph in the preface of his "Flora of Manila" I have been wondering what percentage of lowland plants in the flora are in common with lowland vegetation of other localities in the Philippines, in order to ascertain the extent of usefulness for the manuel.

So, while determining my more recently collected grasses and sedges from the Irosin valley, I thought it a good idea to make a fair comparison of my glumaceae with those reported from the vicinity of Manila. Only this group of plants can be used, the woody plants of an alpine nature are not considered for obvious reasons. Therefore, we can naturally expect that in these well known and widely distributed plants of the above named groups, the manuel on the glumaceae for Manila and environs would fairly cover the field in other districts.

The Irosin valley of Sorsogon province, southern Luzon is only a little above sea level and about twenty kilometers inland. This beautiful valley is rich in plants

MISSOURI BOTANICAL
RECEIVED
JUL 6 1938

belonging to *Gramineae* and *Cyperaceae,* and since this group of plants is also abundantly represented in the flora of Manila, it would prove of interest to make an enumeration of my glumaceae from Irosin for relative comparisons.

We find in the following list, the *Cyperaceae* of the Irosin valley contains about as many genera and species as are found in the flora of Manila. However, there are four genera represented at Irosin not in the vicinity of Manila, and Manila has five genera not in the list below. Again, Irosin has twenty two species not found about Manila, while Manila has twenty nine species not collected at Irosin.

Of the *Gramineae,* the list of the Irosin valley contains only two thirds as many genera and less than one half as many species as are recorded from Manila and its vicinity. There are eight genera represented in my Irosin collection which are not in the Manila flora, and Manila has twenty genera not found about Irosin. Again, there are seventeen species from Irosin not represented in the Manila flora, while Manila contains sixty nine species not known from the Irosin valley.

It is therefore quite evident that for specific determinations at least, a person cannot classify the glumaceae growing spontaneously in the Irosin valley by those recorded from a similar region in the surroundings of Manila. And when one tries to consider the trees and shrubs of the hills and mountains of our area, the difference in the floras of the two localities becomes far greater. The "Flora of Manila" has well served its purpose for a quarter of a century for Manila and its environs, is still useful, but it needs a revision.

In this article four new species of sedges or *Cyperaceae* are described, all of which were discovered in rather low alpine regions. No new ones were found among the grasses or *Gramineae,* although in past years the mountainous country of northern Luzon yielded quite a number of new species and a few new genera.

GRAMINEAE

ANDROPOGON LINNAEUS

Andropogon aciculatus Retz.

Number 16732 from Irosin, collected by *Elmer.* Everywhere in turf and pastures from seacoast to middle or subalpine altitudes of the Philippines. It is the most common of our noxious grass pests on account of its reddish colored spikelets sticking to one's foot wear and clothes. Its awns or sharply pointed seeds militate against its use as a fodder plant. We know of no other grass strong enough likely to smother it. It is very abundant along roads and is reported to be a suitable cover plant for coconut plantations in our islands. From China and India southward through Malaya to tropical Australia and the Polynesian islands.

APLUDA LINNAEUS

Apluda mutica Linn.

Number 15440 from Irosin, collected by *Elmer* in thickets or in among other grass species in open places of subalpine regions. This is one of our coarse forage plants. Tropical Asia and Australia.

CENTOTHECA DESVAUX

Centotheca latifolia (Obs.) Trin.

Stems several, terete, green, decumbent from the base, ascending otherwise, 1 to 4 feet long; roots wiry, yellowish

white; leaves submembranous, horizontal, recurved, sides wavy, much lighter green beneath; panicle pale green, erect or suberect, the spikelets with their rachises early falling and becoming attached to clothing of passers-by.

Number 16831 from Irosin, collected by *Elmer* in small clusters rather tightly grafted to the compact ground of woods at 1000 feet altitude. It is also classed as a coarse forage grass. Tropical Asia and Africa.

CHLORIS SWARTZ

Chloris barbata (Linn.) Sw.

Small tufts; stems few to several, decumbent at the base, rigid and much compressed, subterete and green otherwise, a yard or less in length; the fibrous roots whitish; blades scattered from the base, ascending but finally much recurved, dull green on both sides, deeply caniculate; rachis and spikelets pale green, the latter descending, the bristles atropurpureus.

Number 16493 from Irosin, collected by *Elmer* in compact soil along the main road at 1000 feet altitude. A pantropic weed of American origin.

DACTYLOCTENIUM WILLDENOW

Dactyloctenium aegyptenium (Linn.) Richt.

In tuftlets; stems few, 1 to 2 feet long, decumbent or creeping at the base, subterete and pale or whitish green toward the base, terete and green otherwise; fibrous roots also along the lower joints; blades ascending or horizontal, slightly recurved, flat, pale green on both sides, soft pubescent; spikes divaricate, varying from 1 to 4, straight, quite rigid, pale green except the outer or upper glumes which are brown or atropurpureus.

Number 16495 from Irosin, collected by *Elmer* in hard ground along the automobile road at 750 feet altitude. This weed is also pantropic in distribution.

DIGITARIA SCOPOLI

Digitaria corymbosa (Roxb.) Merr.

Stems reclining at the base, a yard long more or less, otherwise ascending or erect, pale green beneath, subcompressed, smooth, usually few branched from the middle or below it, the exposed portion becoming purplish tinged; sheaths similarly colored when exposed and old, rather loose, provided with setose hairs; roots few and rather short, fibrous, sometimes arising from the lower joints; blades few, ascending and recurved, flat, soft membranous, pale green on both sides, alternating toward the distal end of the culm; spikes pale green, ascending but ultimately widely spreading, rather straight, with red stigmas.

Numbers 16417 and 16818 from Irosin, collected by *Elmer* as a scattering or loosely spreading plant among other grass species in well drained soil along the road at 1000 feet or at 1500 feet altitude among the hemp fields. It was sent out as *Digitaria consanguinea Gaud.* India and Formosa, through Malaya to Samoa.

Digitaria longiflora (Gmel.) Pers.

Number 16733 from Irosin, collected by *Elmer.* Known in the Philippines from northern Luzon to southern Mindanao. It forms compact masses and is a good turf grass. In all warm countries of the Old World.

Digitaria sanguinalis (Linn.) Scop.

Stems soft, decumbent at the base, ascending and finally erect, few branched, light green, the leaves much recurved, membranous, light green on both sides.

Number 15147 from Irosin, collected by *Elmer* in ditches and on wet earth along the divide toward Bulan at 750 feet altitude. Our specimen does not exactly match the other Philippine specimens nor the foreign

Digitaria sanguinalis (Linn.) Scop., but it does match number 220, Guam Experiment Station.

DINOCHLOA BÜSE

Dinochloa scandens (Blm.) Kze.

Number 15311 from Irosin, collected by *Elmer* in the foothills along ridges at 1000 feet altitude. It is difficult to cut a trail through a tangle of this species. Malay Peninsula and Archipelago.

ELEUSINE GAERTNER

Eleusine indica (Linn.) Gaert.

Stems several, radially clustered, decumbent at the rigid compressed greenish white base, 2 to 3 feet high, the larger ones few stemmed below the middle, subterete, pale green and very smooth above the middle; fibrous roots stout, profuse, tightly attached to the ground; blades ascending but gradually recurved toward their tips, deeply folded, submembranous, similarly green on both sides; spikes ascending, spreading, quite rigid, the descending spikelets pale green.

Number 16494 from Irosin, collected by *Elmer* in dense tufts of compact soil along the road side at 750 feet altitude. In all warm countries and especially in settled districts.

ERAGROSTIS BEAUVOIS

Eragrostis unioloides (Retz.) Nees

Forming dense masses; stems erect, pale green; leaves cauline, ascending, curvingly folded upon the upper somewhat glaucous green surface; panicle erect, the stalks greenish white, the spikelets becoming pale red, otherwise pale green.

Number 14531 from Irosin, collected by *Elmer* in black soil along ditches draining the meadows at 500 feet alti-

tude. A handsome grass, only sparingly collected in central Luzon. Tropics of the Old World, introduced in the New World.

Eragrostis viscosa (Retz.) Trin.

Forming tuftlets; stems many from the same root, decumbently spreading, green, the greater portion covered by the dry brown colored sheaths; panicle erect, very fine, all the stalks green, the spikelets much lighter green.

Number 14384 from Irosin, collected by *Elmer* in rich dry ground of meadows in the valley. It was sent out under *Eragrostis tenella R. & S.* In waste ground of India to Malaya.

GARNOTIA BRONGNIART

Garnotia stricta Brong.

Dense tufts with whitish fibrous roots; stems few to several, erect, terete, dull green, shining, dry, bract or sheath covered at the purplish base, a yard long more or less; leaves membranous, cauline, equally dull green on both sides, ascending but gracefully recurved toward their tips; panicle erect from the base, otherwise recurved and subdrooping, dark green except the atropurpureus glume tips and their bristles.

Number 16633 from Irosin, collected by *Elmer* in loose black humus covered ground of a wooded ridge at 1500 feet altitude. India to the Hawaian islands.

IMPERATA CYRILLO

Imperata exaltata Brong.

Number 15500 from Irosin, collected by *Elmer*. It is one of the smaller and less abundant of the cogon species, yet widely scattered in Luzon, Palawan and Mindanao. These fully grown cogon plants with other grasses are in the dry season burnt over in the cattle

raising regions. The new or young plants will soon afford fresh grazing for the animals. From Java to the Moluccas.

ISCHAEMUM LINNAEUS

Ischaemum digitatum Brong.

Numbers 16936 and 17408 from Irosin, collected by *Elmer*. Previously only twice collected, once on Leyte and once on Samar, the twin islands of the Philippines. More recently it has come in from Surigao. Easily confused with the following species but it is ranker, has broader leaves and its sheaths are usually provided with soft hairs. In the Moluccas.

Ischaemum intermedium Brong.

Scattering patches; basal stems prostrate and occasionally branched, rather hard and rigd, green, only the terminal portion erect; roots slender, arising from the joints; leaves soft, paler beneath; spikes 3 to 5, erect or ascending, greenish; stigmas reddish brown.

Number 14326 from Irosin, collected by *Elmer* in shallow sweet clear water of meadows and in drier ground along irrigation canals of the valley. It offers good pasturage and is commonly mixed with other low grasses of open areas. In the Carolines.

LEPTASPIS R. BROWN

Leptaspis urceolata (Roxb.) R. Br.

Stems suberect, upon rigid aerial or proproots, varying from 1 to 3 feet high, the larger usually few branched from the middle or below it, shining green, suberect; leaves chiefly cauline, upon erect green sheathing petioles which for the greater part become separated from the stem; blades horizontal, chartaceous, dull green on both sides, usually concave on the lower surface; spikelets of the old panicle dull brown and hispid, by means of which they easily stick to a person's clothes.

Number 16542 from Irosin, collected by *Elmer* in hard soil of thickets or in dry woods and along dry stream beds at 750 feet altitude. In our islands its distribution is chiefly along the Pacific coast from Polillo to southern Mindanao. Only one other species occurs in southern Mindanao, but it is a finer and much less common grass. Ceylon, Malay Peninsula through the Moluccas to New Guinea.

LOPHATHERUM BRONGNIART

Lophatherum gracile Brong.

Scattering and forming dense mats; stems ascending or reclining a trifle at the base, usually few clustered, green, soft; leaves membranous, also ascending, flat, appearing slightly corrugated on the upper darker green surface; sheaths dark green; panicle erect, similar in color.

Number 16447 from Irosin, collected by *Elmer* in damp but compact earth along trails in woods at 1500 feet altitude. India to Japan, southward through Malaya to New Guinea.

MISCANTHUS ANDERSSON

Miscanthus japonicus (Thunb.) Andr.

Forming tussocks; stems erect, numerous, 1 inch thick, terete, hard and rigid; sheaths pale green, covered with light brown hairs especially on the older ones, 10 to 15 feet high; leaves apparently in alternating rows, ascending from the base, finally much recurved, 1 inch wide, 2 to 3 feet long, flat, coriaceous, the stout midrib whitish above; panicle erect, profuse, reddish brown.

Number 17008 from Irosin, collected by *Elmer* in moist stony ground of open places among the woods at 2000 feet altitude. Babuyan islands to Mindanao, from Japan to the Moluccas and Polynesia.

OPHIURUS GAERTNER

Ophiurus exaltatus (Linn.) Ktz.

Perennial in compact cogon ground flats; culms terete, nearly 5 feet high, thickened at the root bearing base, green, sheathed by brown bracts; laminae ascending, scattering, deeply channelled, smooth, pale green on both sides, subcoriaceous; spikes green, terete, ascending from the base, gracefully recurved toward their ends.

Number 16486 from Irosin, collected by *Elmer* at 750 feet altitude. Since 1915 it was sent out as *Rottboellia tongcalingii Elm.*, and what is worse it was published as such in Leafl. Philip. Bot. volume VII page 2680. Outside the Philippines it extends from India to tropical Australia.

OPLISMENUS BEAUVOIS

Oplismenus compositus (Linn.) Beauv.

Number 15347 from Irosin, collected by *Elmer*. It is a fairly good pasture grass, especially when mixed with other grasses. In the Philippines it is found in most islands and provinces, otherwise pantropic.

Oplismenus undulatifolius (Ard.) Beauv.

Trailing and forming decumbent mats; stems green, occasionally rebranched, horizontal, taking roots at the joints; the leaf bearing portion suberect and relatively short; laminae soft and membranous, flat, paler green beneath; spikes erect, green; spikelets divaricate, the glumes also green, awns purplish brown, stigmas cremeus.

Number 17105 Irosin, collected by *Elmer* in fertile soil of gentle slopes covered with hemp tussocks at 1000 feet altitude. It is one of our best pasture plants for stock. Malaya and tropical Asia, also in Europe.

ORYZA LINNAEUS

Oryza minuta Presl

Number 17407 from Irosin, collected by *Elmer.* It was sent out as *Oryza latifolia Desv.* In Borneo and the Malay Peninsula.

Oryza sativa Linn.

This is the cultivated rice. In the Irosin valley it is planted in December and January, and is being harvested in May and June. Only one crop is taken, although there is time and plenty of water for another crop. During the fallow part of the season, the land is drained dry and used as pasture. Sometimes during the harvest time, hard rains accompanied with wind throws great areas of the nearly mature standing rice down upon the wet ground, making the harvesting more difficult. The mature panicles are heavy and become strongly recurved or drooping. In color they are greenish, ferrugineus to atropurpureus, but mostly chaffy brown.

Number 16256 from Irosin, collected by *Elmer* in mud fields of the valley. Of this grass *Merrill* writes, "Extensively cultivated throughout the Philippines but not a native of the Archipelago, although of prehistoric introduction. The rice plant is enormously variable and probably several hundred distinct cultural forms occur in our islands."

PANICUM LINNAEUS

Panicum amplexicaule Rudge

Stems decumbent at the base, with large joints, 3 to 5 feet long, occasionally branched, terete, pale green, not rigid; leaves ascending, slightly paler beneath; spikes similar in color, erect, terete.

Number 14561 from Irosin, collected by *Elmer* in wet black swale ground of rice fields in the valley. It is a pantropic grass species.

Panicum auritum Presl

Small tufts forming dense masses; stems 2 to 4 feet long, reclining at the base, occasionally branched below and taking root at the joints, terete, green, soft in texture, ultimately erect; blades ascending from the sheathing base, finally much recurved, membranous, very smooth and dark green on both sides; panicle erect though recurved toward the top, not widely spreading, green especially the rachis and rachilla, the soft spikelets paler green and where exposed purplish tinged.

Numbers 16398 and 14344 from Irosin, collected by *Elmer*. The former number grew in fertile soil of the hemp fields and in other forest clearings at 2000 feet altitude. The latter number was collected along irrigation ditches of the valley. Alanao in Bicol. Tropical and subtropical Asia.

Panicum colonum Linn.

Dense clusters; stems 1 to 2 or more feet high or long, ascendingly curved from the base, flattened, whitish or purplish tinged, branched mainly from below the middle or toward the base; laminae membranous, ascending, pale green on both sides; spikes erect or ascending, similar in color but when fully mature chaff colored.

Number 16243 from Irosin, collected by *Elmer* in black wet or muddy ground near rice fields at 750 feet altitude. Boganang in Bicol, and is a good forage grass. *Panicum cumingianum Steud.*, based in part upon 1422 *Cuming* (not 422) is a very closely related species. In most warm countries.

Panicum crus-galli Linn.

Coarse and rank annuals or biennials; stems 1 to 2 yards long, decumbent and rooting along the joints toward the base, soft and greenish white near the ground, green and erect toward the top, the larger stems few branched from the middle; blades submembranous, ascending, similarly green on both sides; panicle erect, finally recurved, the spikelets pale green, the exposed beards atropurpureus.

Number 16255 from Irosin, collected by *Elmer* in paddy ground of rice fields at 750 feet altitude. Throughout the world in tropical and subtropical zones.

Panicum indicum Linn.

Stems 1 to 3 feet long, decumbent or reclining toward the base, covered by the dry leaf sheaths, occasionally few branched, ascending and finally erect; roots from the lower joints; laminae membranous, flat, ascending, similarly dark green on both sides; spikelets soft but erect, green as the foliage.

Number 14423 from Irosin, collected by *Elmer* in rich black soil bordering streamlets of the meadows in the valley. Most *Panicum* species afford good pasturage, even the coarser plants when young or half grown are liked by cattle and horses. Tamungosa in Bicol. India, Malaya to tropical Australia.

Panicum malabaricum (Linn.) Merr.

Decumbent and creeping masses; stems varying from 1 to 3 feet long, soft and very flexible, terete, the basal portion clothed with dry sheaths, above pale green and atropurpureus in the nodal regions, frequently few branched from near the base or below the middle, producing soft fibrous roots from the lower joints; blades soft, divaricate, slightly paler beneath, flat; panicle erect, all the stalks dark green, the spikelets pale or relatively yellowish green.

Number 16496 from Irosin, collected by *Elmer* in loose ground of the Bulan automobile road embankments at 750 feet altitude. Previously only a few times collected on Palawan island. This is another instance where the distribution of Palawan plants along the China Sea extend over Sorsogon province to the Pacific Ocean side. India to Malaya.

Panicum patens Linn.

Culms decumbent or suberect from the base, rather thin, green and rigid, usually branched at about the middle, terete, smooth, shining; leaves ascending though with recurved tips, subglaucous green beneath; roots arising from the lower joints.

Numbers 14496 and 15360 from Irosin, collected by *Elmer* in low places or along ditches of meadows in the valley and in other similar areas. This and the following species are soft low spreading grasses, and with other similar grass plants offer an abundance of green fodder to stock on the range the year round. Outside distribution is the same as for the preceeding.

Panicum pilipes Nees

In damp or wet ground or even in shallow clear water covered areas of the valley. It is also relished by stock.

Numbers 15472 and 15410 from Irosin, collected by *Elmer*. Common and is known from practically all of our islands. The latter number is not typical. India to the Mascarene islands, Malaya, Polynesia and tropical Australia.

PASPALUM LINNAEUS

Paspalum conjugatum Berg.

In tuflets or creeping; culms 6 to 16 inches high, brown, rigid and subcompressed toward the decumbent

base, taking fibrous roots from the lower joints as well as from the tuftlets, sparingly branched below the middle or toward the base; leaves scattered, very soft membranous, characteristic pale or yellowish green on both sides, flat, ascending or divaricate; spikes also divaricate, usually in pairs, the rachis green, the pendantly folded spikelets sulphureus.

Number 16497 from Irosin, collected by *Elmer* in compact ground along both sides of the automobile road at 750 feet altitude. This grass species is very common and affords pasturage, and when closely grazed it makes an effective lawn or turf grass. Tropical American, now pantropic.

Paspalum longifolium Roxb.

Number 16727 from Irosin, collected by *Elmer*. This as well as the above named species are relished when young by the work animals. Tropics of the Old World.

PENNISETUM PERSOON

Pennisetum macrostachyum Trin.

Number 15327 from Irosin, collected by *Elmer*. In wet abandoned fields at low altitudes. Malay Peninsula and Archipelago to Polynesia.

PHRAGMITES TRINIUS

Phragmites vulgaris (Lam.) Trin.

A marsh grass; stems 5 to 9 feet high, rigid, terete, erect, numerous and forming dense masses, the larger culms 1 inch thick at the base, infrequently branched; blades tough, ascending, dull green on both sides; panicle erect, the green branches lax and somewhat drooping; the spikelets dull reddish brown.

Number 14560 from Irosin, collected by *Elmer* along water ditches and canals and in other low and wet places. Warm countries of both Hemispheres.

POGONATHERUM BEAUVOIS

Pogonatherum paniceum (Lam.) Hack.

Dense but comparatively small clumps; stems suberect, numerous, fine, green, usually few branched; spikes very soft brown hairy, erect or nearly so.

Number 15130 from Irosin, collected by *Elmer* in wet earth along automobile road cuts at 750 feet altitude. More or less confined to steep ravines, upon cliffs and even in rock crevices of dry river beds. Widely distributed in Asia.

ROTTBOELLIA LINNAEUS

Rottboellia exaltata Linn.

Rank masses; stem terete, one half of an inch thick, 2 to 3 yards high, usually erect, occasionally few branched at the middle or from above it, the branchlets ascending or erect; leaves profuse, edges and midrib finely serrate, cauline, ascending but tips recurved, flat, slightly paler beneath, folded toward the base; sheaths persistent, provided with stinging hairs; spikes erect, terete, green, the spikelets becoming easily detached; stigmas velvety brown or purplish black.

Number 14524 from Irosin, collected by *Elmer* along a trail near springs and streamlets at 500 feet altitude of the Manila hemp fields. This particular grass species forms tangles in favorable places, either in hot and dry or in open damp ground. It is unpleasant to come in contact with it out in the field, because of its sharply serrated leaf edges which cuts into one's hands and exposed arms sufficiently to draw blood. This sensation is felt at once and for a moment only, and just as quickly it is all over with, no ill effects developing from it. Its pubescent hairs on the old sheaths is another unpleasant feature, for they are quite irritating to one's skin, especially when one is in

a state of perspiration. In February 1904 I collected it for the first time and mentioned this stinging quality as being similar to that of a nettle. None of the other numerous collections made of this plant since then, have noted this stinging and cutting quality of this grass. Tropical Africa and Asia.

SACCHARUM LINNAEUS

Saccharum spontaneum Linn.

Culms several or numerous in a cluster, ascending, one third of an inch thick and dry sheath covered toward the base, usually few branched from above the middle; laminae ascending from the base, otherwise strongly recurved, caniculate, subglaucous beneath; panicle erect or nearly so, soft, silvery white; the caryopsis dark brown.

Number 15129 from Irosin, collected by *Elmer* in wet ground of enbankment along the automobile road at 750 feet altitude. Some species of this genus is the cultivated sugar-cane. India to southern China, through Malaya to Polynesia.

SCHIZOSTACHYUM NEES

Schizostachyum lumampao (Blco.) Merr.

Number 16621 from Irosin, collected by *Elmer*. There is some doubt as to the correct identification. This genus and other allied genera contain our most graceful bamboo tree species in the Philippines. Their woody stems are used by the rural and agarian Filipinos for many, many things, from the construction of houses to clothes pins. It is endemic.

SETARIA BEAUVOIS

Setaria geniculata (Lam.) Beauv.

Few stemmed clusters forming dense patches; culms erect, numerous from the same root cluster, slightly de-

cumbent at the base only, pale green, soft, slender; blades also soft in texture, ascending, subglaucous green on the upper scabrid and partly folded side, smooth beneath; spikes erect, terete; seeds or seeds with the glumes pale green; the rachis finally turning reddish brown, the persistent bristles or awns dark yellow when old.

Numbers 14507 and 16487 from Irosin, collected by *Elmer* in fertile moist soil of meadows in the valley. It was sent out under *Setaria flava Kunth*. Throughout the tropics.

Setaria palmifolia (Koenig.) Stapf

Stem decumbent at the base, 1 yard high, occasionally branched; leaves horizontal, gracefully recurved, curvingly folded upon the nether green side, chartaceous; the green panicle erect from the base but strongly recurved toward the apex.

Number 14627 from Irosin, collected by *Elmer* in good ground of woods at 500 feet altitude. A rather ornamental grass. It was sent out under *Panicum palmaefolium Koenig*. India to China and Malaya, introduced in tropical America.

SPOROBOLUS R. BROWN

Sporobolus indicus (Linn.) R. Br.

In small tufts; stems 1 to 3 feet high, ascending from the base, very smooth, white at the base and sheath covered, joints reddish for the upper ones; roots fibrous; blades mainly radicle, ascending, curved upon the upper surface, all dark green; panicle green, turning brownish when dry. Baganang in Bicol.

Number 14345 Irosin, collected by *Elmer* in rather dry ground of coconut bench lands of the valley. The lower or radical leaves are eaten by farm animals. Also a pantropic grass.

THEMEDA FORSKAL

Themeda gigantea (Cav.) Hack.

Number 16764 from Irosin, collected by *Elmer* in open grass lands of steep subalpine mountain slopes. It is a very coarse grass and grows in large tussocks. Confined to tropical Asia.

THYSANOLAENA NEES

Thysanolaena maxima (Roxb.) Ktz.

Number 15535 from Irosin, collected by *Elmer* on steep ravines or upon cliffs along rivers 1500 feet altitude more or less. The panicles of this grass are collected by the natives and tied into various dust brooms and which are extensively sold in the local markets. India, through Malaya to New Guinea.

CYPERACEAE

BULBOSTYLIS KUNTH

Bulbostylis barbata (Rottb.) Kunth

Tuftlets with fibrous roots; stems numerous, smooth, green, very unequal in length, spreading in all directions; leaves hair like, mostly radical; young heads green, brown when mature.

Number 14338 from Irosin, collected by *Elmer* in loose sandy ground along a stream bank of the valley. In most all warm countries.

CAREX LINNAEUS

Carex breviscapa Clarke

Number 15353 from Irosin, collected by *Elmer* in the foothills of subalpine regions at 1000 feet altitude. Previously only known by one collection from Palawan, and

although our specimens are larger or ranker, in essential characters they agree well with *Clarke's* and *Kükenthal's* descriptions. In numerous instances my Sorsogon collection yielded plants previously only known from Palawan. Ceylon and India.

Carex cryptostachys Brong.

Usually in single tufts or tuftlets; stems short, ascendingly curved and erect, at the base clothed with dull or dirty brown sheaths; leaves gracefully descending or reclining down hill, slightly paler beneath, strongly imbricate at or near their ascending bases, dry and brownish, scabrid on the dull or deep green sides; elongated spikes more erect than the foliage, much lighter green or pale to yellowish green.

Numbers 14595 and 16110 from Irosin, collected by *Elmer* in wet humus covered ground of woods on steep slopes at about 2000 feet altitude. Formosa, southern China to the Malay Peninsula.

Carex nodiflora Boeck.

Number 15328 from Irosin, collected by *Elmer* in primary woods or forests at 750 feet altitude. Endemic.

Carex rafflesiana Boott

Number 15522 from Irosin, collected by *Elmer* in densely shaded woods at medium or at 1500 feet altitude. It is present in most of our islands with mountains. Sumatra and Java to northeastern Australia.

Carex vulcanica Elm. n. sp.

Medium sized clusters; roots many, long, wiry, yellowish brown when dry; stems 5 to 7 dm long or higher, very slender, erect or ascending, at the base numerously sheathed, triangular and smooth, the exposed portion greenish, otherwise brown; leaves chiefly radical, numerous, the few cauline ones widely scattered, toward the base ensi-

formly conduplicate, clasping and imbricately enclosing the stem, ascending from the base, finally much recurved, linear, 1.25 cm wide across the middle, as long as the stems, gradually tapering to the elongated tips, membranous, equally dull green on both sides, glabrous, smooth even along the edges; leaf bases pale green or whitish, entirely glabrous but with very evident veins, finally tearing or wearing off, thereby leaving a fringe of persistent dirty brown fibers from near the base of the roots; veins on the laminae less conspicuous, mainly 3, the midvein and a lateral one on each half of the blade, all smooth except the midrib which is minutely scabrid below, the secondary veins are scarcely visible except toward the base; sheaths of the cauline blades boot like, with an oblique orifice, usually with a narrow thin and brown ligule; the lower cauline blade nearly as large as the basal ones, the upper ones becoming reduced: inflorescence on our type specimen 3 dm long, erect or somewhat recurved, very slender, its main axis smooth and triangular as are the stems proper; branches 4, widely scattered, erect, subtended by foliaceous bracts longer than themselves; flowering or fruiting heads glomerated at the distal end of the 5 to 10 cm long peduncle and which heads are subtended by a series of imbricated bracts; the outer ones are green, scabrid, setaceously pointed and dilated at the base, the inner ones brown or subhyaline and are not so pointed; heads or spikes subsessile, up to 1 cm long in the fruiting state; florets sessile, inserted upon the crooked rachis which is compressed or angular and glabrate except along the edges, subtended by boat shaped bracts whose dorsal keel and acuminately pointed apex are scabrid: glumes ovately lanceolate, hyaline, the outer 3 to 4 mm long enclosing the inner one which is shorter and blunter; ventricle persistent, tightly attached to the pistil, ovate and beaked, subhyaline, minutely hispid and faintly striate; pistil smooth, 5 mm long, the ovary angular and one third as long, the style about as long, the 3 linear stigmas

spreading and finely ciliate along the upper or inner sides; achenes sharply triangular, acute at the base, dark brown, ovately elliptic, terminated by a lighter brown or stramineus colored beak.

Type specimen number 17275, discovered by *A. D. E. Elmer* in subalpine regions at Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

Not *Carex nodiflora Boeck.* because our leaves are twice as wide and inflorescence altogether different. My number 15328 from this same locality has typical inflorescences of *Boeckle's* species. Also see number 6449 which I collected in 1904 in the province of Benguet, Luzon, and which was first determined by *Clarke* as *Carex cumingii Vid.* and more recently by *Kükenthal* as *Carex nodiflora Boeck.*

CYPERUS LINNAEUS

Cyperus difformis Linn.

Small tufts; stems erect, soft, pale or yellowish green, at the base clothed with persistent reddish brown bracts or sheaths; leaves similar to the stem in color and texture, conduplicate; heads also soft, green, not hard, globose.

Number 14559 from Irosin, collected by *Elmer* in wet ground of ditches along the automobile road of the valley. This species has become a pantropical weed.

Cyperus diffusus Vahl

Tuftlets, the root bunches fibrous; stems erect, dark green; leaves mainly radical, at the base reddish brown and clothing the stems, the old and dry leaves persistent; inflorescence spreading, the spikes soft and brownish.

Number 14378 from Irosin, collected by *Elmer* in wet sandy ground of a very steep wooded ravine or cliff along the Irosin river of the valley. Pantropic.

Cyperus eragrostis Vahl

Quite dense tufts; stems erect, paler green then the leaves, very smooth, covered toward the base by the old persistent leaves and sheaths; leaves lucid on the upper side; basal bracts brown or nearly black when old; spikes or heads green except the brown colored margins. Bolangmanok in Bicol.

Numbers 14323 and 14336 from Irosin, collected by *Elmer* in wet ground or in shallow fresh water along a streamlet in a meadow of the valley. This species was previously collected only once in the vicinity of Manila, but it is not given in the Flora of Manila nor listed in the Enumeration of Philippine Flowering Plants. In India it is a high alpine plant.

Cyperus haspan Linn.

Stems yellowish green, soft, brown and bract covered at the base; leaves similar in color and texture; spikes not rigid, greenish brown.

Number 14349 from Irosin, collected by *Elmer* in mud flats of the rice fields. It is pantropic in distribution and in the Philippines it is a weed.

Cyperus iria Linn.

Stems few from the same root, erect, yellowish green toward the base and covered with reddish brown sheaths; spikelets yellowish when mature, the rachis rather flexible and occasionally somewhat drooping.

Number 14557 from Irosin, collected by *Elmer* in muddy black ground of ditches and along the automobile road in the valley. A cosmopolitan species of the tropics, in our islands a rice paddy weed.

Cyperus pilosus Vahl

Dense clumps composed of small tufts; stems pale green but pale red at the brown bracteate base, sharply angular, strict, with few leaves; blades chiefly upon sterile stems, rather rigid, mostly from the base and recurved, similarly green on both sides, the inflorescent leaf bracts divaricately spreading; spikes not rigid, shining, pale green to greenish brown.

Numbers 14340, 14329 and 16726 from Irosin, collected by *Elmer* in shallow clear water flats of meadows around carabao or mud buffaloe wallowering places in the valley. Common in open wet places. A tropical plant of both Hemispheres.

Cyperus radiatus Vahl

Small tufts; stems few, erect, bluntly triangular, pleasing green, brown at the base and covered with similarly colored bracts; leaves ascending, conduplicate, yellowish green; the inflorescent stalks dark green; spikes strict but not rigid, brown. Gingot in Bicol.

Numbers 14365 and 17019 from Irosin, collected by *Elmer* after a heavy rain in clear and still water meadow flats of the valley. Throughout the Philippines in open pasture lands. Pantropic.

Cyperus rotundus Linn.

Number 16915 from Irosin, collected by *Elmer* in open places at 500 feet altitude. In our Archipelago it is mainly along roads, in waste places and encroaching upon lawns. Also pantropic.

Cyperus silletensis Nees

Dense tufts in rich ground of a clearing at 750 feet altitude.

Number 15154 from Irosin, collected by *Elmer*. This species has hitherto not been known from our islands, and is here for the first time reported from the Philippine Archipelago. Bengal, Assam, Sikkim and Burma.

Cyperus zollingeri Steud.

Few stemmed tuftlets; stems slender, erect or ascending, angular, smooth, whitish beneath or toward the base and brown sheath covered, otherwise grass green; leaves quite rigid, erect or nearly so, smooth, similarly green on both sides, prominently keeled beneath and grooved above; rachis green, subtended by erect foliage bracts; spikelets shining, yellowish.

Number 16488 from Irosin, collected by *Elmer* in compact cogon flats at 750 feet altitude. In our islands it is sometimes collected at much higher elevations, and it belongs to the tropics of the Old World.

ELEOCHARIS R. BROWN

Eleocharis equisetina Presl

Dense masses; stems terete, strictly erect, soft, paler green toward the ground or water surface, whitish at the base and red bract covered; spikes erect, greenish when young, rusty yellowish brown when old, also terete or rounded.

Number 14341 from Irosin, collected by *Elmer* in rich black soil saturated with water standing near rice fields of the valley. Chiefly tropical Asia and Africa, also in Madagascar and New Caledonia.

Eleocharis retroflexa (Poir.) Urban

Forming dense masses; stems numerous, hair like, erect from the reddish brown bases, otherwise gracefully recurved, pleasing light green; the small terete spikes suberect and brown.

Number 14558 from Irosin, collected by *Elmer* in wet sandy ground along irrigation ditches and along the roadside of the valley. This is also a pantropic sedge.

FIMBRISTYLIS VAHL

Fimbristylis acuminata Vahl

Dense clumps; stems numerous, ascending and finally recurved, pale green, very smooth; heads terminal and usually somewhat tilted; bracts paler green. Bagot-bot in Bicol.

Number 14322 from Irosin, collected by *Elmer* in water soaked meadows of the valley. In open wet places or in old rice paddies of our islands, otherwise in tropical Asia.

Fimbristylis annua (All.) R. & S.

Stems rigid and glaucous green toward the base; leaves ascending and curved, subglaucous green beneath, curvingly folded upon the upper side; branches of inflorescence dull green, the terete suberect heads brown and open at the top.

Numbers 14555 and 15245 from Irosin, collected by *Elmer* in herbaceous thickets along irrigation ditches of the valley. It was sent out under *Fimbristylis diphylla Vahl.* Variable and abundant. Pantropic in nature.

Fimbristylis complanata (Retz.) Link.

Tufted; stems flat and whitish toward the base, covered with dark brown bracts, the upper portion dark green; spikes not rigid, also brown, subterete. Ambot in Bicol.

Number 14324 from Irosin, collected by *Elmer* in wet ground or in fresh rain water of the meadows of the valley. Distributed in all warm countries.

Fimbristylis globulosa (Retz.) Kunth

Number 15584 from Irosin, collected by *Elmer*. This species is a smaller dry land plant than the type specimen of *Fimbristylis utilis Elm.*, and for that reason it is more common and is widely distributed. My type number 12571 from Samar forms pure stands in marshes and in half swampy regions, is therefore more localized and is the true ticog from which the Samar and Tacloban mats are made. The two species should not be confused for their technical differences in flowers, fruits, vegetation and habit of growth. The distribution of *Fimbristylis globulosa (Retz.) Kunth* outside the Philippines is India to Malaya and Polynesia.

Fimbristylis meliacea (Linn.) Vahl

Rather evenly scattered; stems with leaves erect, quite numerous, slender and smooth, dull or dark green, the blades strongly folded especially toward the base; rachis lax, also dark green; the spikelets ovoidly globose, dull brown.

Numbers 14556 and 16725 from Irosin, collected by *Elmer* in mud flats of the rice fields of the valley. This sedge is considered a pantropic weed.

Fimbristylis quinquangularis Kunth

Coarse clumps; stems quadrangular, smooth, pale green, yellowish and brown scale covered toward the base; spikes ellipsoid, brown, not rigid. Tolong-manok in Bicol.

Number 14325 from Irosin, collected by *Elmer* in shallow sweet water meadow lands of the valley. India to the Riu Kiu and Mariannes.

FUIRENA ROTTBOELL

Fuirena ciliaris (Linn.) Roxb.

Number 16730 from Irosin, collected by *Elmer*.

Common and occasionally abundant in our field. In the tropics of the Old World.

Fuirena umbellata Rottb.

Forming clumps; stems 5-angular, pale green especially toward the base where they are covered by brown sheaths; blades ascending or divaricate, smooth on both sides, of the same color as the stems; spikes soft, green when young, turning brown with age.

Number 14334 from Irosin, collected by *Elmer* in ground of open areas of the valley. Another pantropic sedge.

HYPOLYTRUM L. C. RICHARD

Hypolytrum scirpoides (Presl) Merr.

Small tufts; stems solitary or more, 2 or 3 or even 5-clustered, ascending, with numerous brown roots; leaves ascending from the triangular base, finally much recurved, deeply grooved upon the darker green upper side, mostly radical though with 1 or 2 cauline ones; peduncle slender, green, smooth, triangular with rounded edges; inflorescent branches with dark green bracts; spike bracts brown, the small nuts or seeds very dark green.

Number 15916 from Irosin, collected by *Elmer* in humus covered soil of steep forested slopes at 1500 feet altitude. It was sent out under *Hypolytrum philippinense Clarke*. In Borneo and the Philippines.

KYLLINGA ROTTBOELL

Kyllinga brevifolia Rottb.

Dense tufts; rootstocks short and ramifying, reddish; stems erect, green, the basal sheaths also reddish; leaf blades membranous, ascending; heads grass green except the brownish stigmas, terminating at right angle with

the stem. Cadang-cadang in Bicol.

Number 14321 from Irosin, collected by *Elmer* in water soaked meadows of the valley. In lawns or open grass lands of the Philippines. Pantropic as most of our lowland glumaceous plants are.

Kyllinga monocephala Rottb.

Loose clusters; stems diverse in size from a few inches to a foot or two in height, with rhizomes; leaves soft, green as the stems which are bract covered at the base; heads solid, white or nearly so.

Number 14337 from Irosin, collected by *Elmer* in open dry grass lands. In most lawns it is a pest. Throughout the tropics.

MAPANIA AUBLET

Mapania alpina Elm. n. sp.

Large tufts, upon wiry proproots; stems 1 to 1.5 cm thick or often larger, hard and very tough, clothed with the old leaf stubs which become shredded and finally disappear except the persistent fibers; leaves erect or ascending, submembranous, tips recurved, ensiformly imbricated toward the base, apex gradually and setaceously pointed, curing nearly equally greenish on both sides, 1.5 cm wide at or slightly above the middle, similarly narrowed toward both ends, the very slender tips scabrid, not expanded at the base, narrowly linear in shape, from 4 to 6 dm in length, the deeply folded base straw brown, edges scabrid toward the slightly narrowed or attenuate base and toward the laciniate apex, otherwise smooth; midrib narrowly ridged beneath and scabrate, narrowly depressed above, with an evident vein or nerve on each half of the laminae, the secondary ones scarcely visible from either side, often the blades are marked with obscure lighter brown transverse bars, at the base a trifle wider than 3 to 5 cm above

it, usually with a thin brown fimbriate ligulate margin, the stubs persistent; inflorescence arising from the lower leaf axils even in the fruiting stage, erect but at the base ascendingly curved, solitary; peduncle very slender or filiform, when old widely curved, 1 to 2 dm long, scape like except the bracteate base, near the top slightly thickened and with twisted striae; bracts scattered at or toward the base, 1 to 3 cm long, oblong to lanceolate, thin, bases imbricately enclosing the very fine peduncle, striate, glabrous, thin, brown, usually only 3, subpersistent, the basal one smaller or reduced; flowering heads narrowly oblong, 1 to 1.5 cm long, one third as wide, erect, the twisting and imbricate outer rather rigid and brownish colored bracts enclosing the dark brown brush of stigmas belonging to a single spike, the longer ones equalling the entire head; fruiting heads 1 to 1.25 cm across, subglobose or short ovoid, subtended by the shreded bracts and bracteoles; bracts broadly lanceolate, with acute to acuminate apex striate, with reddish brown cross bars especially toward the top; the inner bracts numerous, shorter, linear, much thinner in texture, subhyaline, their keels or midveins and margins usually ciliate toward the apex; rachis straight, subterete, glabrous; florets crowded along this central axis, upon distinct pedicels; inner bracts or glumes hyaline, united around the stipe where they are conspicuously reddish brown spotted; the upper portion of these floral bracts or glumes are linearly segmented or even lacerated, closely surrounding the style and stigmas, sparingly spotted, the margins and midrib of them are often a little ciliate toward the apex; ovary short stipitate or acute at the base, compressed or obscurely angular, glabrous, brown, the edges as well as the sides densely sprinkled with reddish brown spots, broadly spindle shaped from the side view, similarly tapering toward the apex which is extended into a slender beak or up to the croooked twist at the beginning of the style proper; style filiform, lighter brown, smooth, 5 to 8

mm long including the stigmatic lobes; stigmas 3, one abnormal or abortive and remaining as a clavate appendage, the other two very slender and much recurved, all brownish; achene or caryopsis 2.5 mm by 4 mm, ovoidly globose, sessile and broadly rounded at the base, obscurely terete toward the blunt conical apex which extends into a much lighter colored mucro, dull brown, densely covered with reddish brown spots, subtended by the persistent marcescent bracts.

Type specimen number 14864, discovered by *A. D. E. Elmer* in the woods at 3500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

Our foliage is very similar to that of *Mapania banahaensis Elm.* but the very slender and shorter peduncles terminating solitary heads at once mark it as distinct. It certainly is not *Elmer* 12380 from Sibuyan island and distributed as *Mapania humilis (Hassk.) Vill.* Some of our socalled Philippine materials of this species do not match foreign specimens in the herbarium.

Mapania kurzii Clarke

Terrestrial and perennials; stem terete, 1 inch thick, descending and then suberect toward the dense foliage, blackish brown, the similarly colored roots wiry; leaves dry, not rigid, numerous in 3 rows, ascending from the base, much recurved toward their distal ends, deeply channelled above, keeled beneath, darker green on the upper surface; peduncles erect, axillary, subterete and greenish, terminated by a conglomerate cluster of dirty brown spikes; the obovoid nutlets or seeds or caryopsis are olivaceus.

Numbers 16222 and 15519 from Irosin, collected by *Elmer* in rich loose humus covered soil of steep densely wooded slopes at 1000 feet altitude. Malay Peninsula.

Mapania humilis (Hassk.) Vill.

Number 16301 from Irosin, collected by *Elmer*. Malay Peninsula and Archipelago.

MARISCUS GAERTNER

Mariscus pennatus (Lam.) Merr.

Number 17413 from Irosin, collected by *Elmer*. Reported to grow within the influence of brackish water throughout the Philippine Islands. It was sent out under *Mariscus stuppeus (Forst.) Merr.* Tropics of the Old World.

PARAMAPANIA UITTIEN

Paramapania rostrata (Elm.) Uitt.

Small tufts firmly rooted; stem short, ascendingly curved, with profuse fibrous black roots; leaves also profuse or ample, densely crowded in 3 rows, the basal portion blackish brown or dark atropurpureus; cauline blades at first ascending, otherwise curvingly descending down hill, pale green especially beneath, not harsh to touch; inflorescence as well as infructescence upon very slender stalks arising from the lower leaf axils and usually hidden below the humus or exposed on the down hill side, the terete flowering spikes as well as the subspinescent fruiting heads atropurpureus.

This type number 16150 from Irosin was discovered by *A. D. E. Elmer* in loose humus covered ground among shrubberries of a very steep incline at 1750 feet altitude. Nearly twenty-two years ago it was distributed under a new name, *Mapania rostrata Elm.* new species. Ten years later this same species was rediscovered on Alabat island. In the meantime, it was transferred to *Paramapania rostrata (Elm.) Uitt.* in Rec. Trav. Bot. Neerl. 32: 184, 1935. *Mapania gracillina Kük. & Merr.* is the only other *Paramapania* species known from the Philippines.

SCIRPUS LINNAEUS

Scirpus erectus Poir.

Stems few to several, forming small clusters, erect, shining dark green; heads also green but turning brown with age, terete, not very rigid.

Number 14351 from Irosin, collected by *Elmer* in mud flats of rice fields of the valley. Generally found in all warm countries.

Scirpus grossus Linn.

Marsh plants forming masses; stems green, 5 to 8 feet long, strictly erect, sharply angular; leaves few from the base, ascending and then recurved, pale green; inflorescence erect, not rigid, the stalks green, the terete spikes dark brown.

Number 14630 from Irosin, collected by *Elmer* in wet or water covered black and heavy soil of open flats of the valley. Indo-China.

Scirpus mucronatus Linn.

Dense tussocks; stems also sharply angular, leafless, green, at the white base covered with brown sheaths; heads quite rigid, green but brownish when old; anthers versatile, exerted, pale yellow.

Number 14333 from Irosin, collected by *Elmer* around shallow clear water pools in meadows of the valley. Tropics of the Old World.

SCLERIA BERGIUS

Scleria hebecarpa Nees

Few stemmed clusters or tuftlets; stems sharply angular, thinner and yellowish white toward the base, otherwise pale green and very scabrid along the edges; leaves alternating all along, nearly smooth, pale green but es-

pecially so beneath, flat; panicle rigid, erect, the stalks greenish; the glumes brown; nuts green and minutely hispid when young, chalky white and smooth when fully mature.

Number 16489 from Irosin, collected by *Elmer* in compact ground of cogon flats at 750 feet altitude. It was sent out as *Scleria bulusanensis Elm.*, a provisional new name. Japan to India and Australia.

Scleria lithosperma (Linn.) Sw.

Number 17351 from Irosin, collected by *Elmer*. In the Philippines from most islands and provinces. In the tropics of both Hemispheres.

Scleria scrobiculata Nees

Rank perennial herbs; stems erect, green, more or less scattered, sharply triangular, 5 feet high, at the base clothed by dull reddish brown bracts; leaves horizontal though their tips are recurved, similarly green on both sides; spicate panicle erect, green except the atropurpureus glumes; nuts pale green, chalky white when mature, with minute cilia or hairs.

Number 16088 from Irosin, collected by *Elmer* in more or less sandy ground among shrubberries at 750 feet altitude. It was sent out under *Scleria multifoliata Boeck.* Tropical Asia in general.

Scleria purpureo-vaginata Boeck.

Dense tufts or tussocks; stems numerous, suberect, triangular, dirty brown toward the base, 5 feet high; leaves chartaceous, horizontal or tips hanging, equally green on both sides; spikes or panicle erect, the stalks dark green, the bracts chaffy brown, the young ones reddish tinged; the pitted nuts or seeds atropurpureus.

Number 16063 from Irosin, collected by *Elmer* in rich wet soil of open jungles mixed with woods in a depression at 2000 feet altitude. Very similar to the above and with about the same geographical distribution.

Scleria sorsogonensis Elm. n. sp.

Perennial, growing in clumps; roots nearly black, rigid, stout, tightly attached to the ground; stem or stems 9 dm long or longer, erect or the older ones ascending, the lower half with leaves, the upper portion bearing the inflorescence or infructescence, stout, sharply triangular, completely sheath covered, the terminal portion brown in the dry state, the basal leaf portion purplish; leaves becoming lacerated from near the base and leaving marcescent stubs, drying unequally brown on its two sides, linear, at most 1 cm wide, 4 to 6 dm long or longer, sublucid on the upper surface, smooth along the edges except toward the slenderly acuminate apex, strongly conduplicate toward the lower end, the basal portion imbricately overlapping, a trifle widened toward the ligule; boots solidly enclosing the culm, reddish brown when cured, plainly striate, smooth and glabrous except the fringe of ciliate hairs around the margin of the oblique orifice of the boot; midrib pronounced and smooth clear into the very slenderly tapering leaf tips, sunken along the upper side, the single lateral vein on each half raised along the upper face, secondary nerves or striae evident from both surfaces; inflorescence or infructescence 6 dm long on my specimen, with all its branches alternating and erect, equidistant, subtended by foliaceous bracts which far exceeds its subtending cluster of flowers; the basal cluster of inflorescent branches 1 dm long, gradually reduced toward the top, the peduncle with its lower branchlets well inclosed by the reddish brown and striate boots; branchlets freely rebranched from the base, brown, glabrate or faintly ciliate along the edges, short and sharply angular, the first branch subtended by laciniate or setaceously point-

ed bracts far exceeding their branches, other bracts similar in proportion; spike narrowly oblong, 5 to 8 mm long, subterete; florets upon a short stipitate base, subtended by several unequal bracts which are hyaline and red spotted especially toward the acute to acuminate apex, the lowest merely ovate; the inner glumes ovately oblong, rather sharply pointed, 3 to 4 mm long, subhyaline, very finely streaked or sprinkled with reddish colored spots; ovary oblongish, in the early state sparsely ciliate; style short, ciliate, dark brown as the ovary; stigmas of the same color, also ciliate, its 2 arms elongated and abruptly recurved, the third a short and erect appendage; utricle trigonous, blunt at the base, apex extended into a slender bifid neck or style, the edges obscurely ciliate, hyaline; achene very short stipitate or truncate when old, angularly winged, terminated in a small conical apex; the mature caryopsis white, the triangular sides smooth and gradually tapering to the rostrate apex, sprinkled on its upper sides and especially toward the apical point with deep reddish brown and minute scales.

Type specimen number 15411, discovered by *A. D. E. Elmer* at about 750 feet altitude at Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, December 1915.

Apparently it is not *Scleria motleyi Clarke*, and by comparison with *Scleria trigona Merr.* it is nearly smooth and more glabrous, has darker reddish brown inflorescence with much longer bracts and by our nutlets being rostrate. It was sent out as *Scleria subrostrata Elm.* a new species.

TORULINIUM DESVAUX

Torulinium ferax (Rich.) Ham.

Number 16830 from Irosin, collected by *Elmer*. Throughout the Philippines and the tropics in general.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, M. A.

Vol. X Manila, P. I., May 1, 1938 Art. 131

NOTES ON ASCLEPIADACEAE

by

A. D. E. ELMER

—x—

In this article I have tried to bring together all of my Philippine *Asclepiadaceae* collected during the past 34 years, and at the same time give a more permanent or nearly correct and permanent status to many of my herbarium plant specimens that were distributed from time to time under provisional names, either as new species or under wrongly determined old names. The revised list before me runs up to 75 species included under 21 genera, but mainly in only 2 genera, the *Hoyas* and *Dischidias.*

So often in this work of careful matching my specimens with other specimens already known I have wished myself back into the field again with a determination to collect far more intensively, and to write more careful or detailed notes of the fresh plants in the field. In fact, I never did collect this group of flowering plants intensively, partly due to my disinclination and partly to their habits of growth. Generally speaking they are not nice nor easy plants to gather. Most of them are high tree denizens, crawling along or matting themselves upon the

MISSOURI BOTANICAL RECEIVED JUL 6 1938

upper and lateral sides of large limbs, or sometimes they climb along the crooked or inclining upper tree trunks. It is difficult for the collector on the ground to see them, and to spy out their small flowers from such distances is a physical impossibility. Of course, there are quite a number of species growing on tree trunks nearer the ground and in other ways are interlacing lower tree branches or even twining upon shrubs and spreading over grass thickets.

When a tree is cut down, these interlaced vines must be carefully extricated from their host and from among numerous other vines or epiphytic vegetation. Usually these plants contain gummy white sap or latex, a character for which they are called milk-weeds in some countries. In handling them your fingers become sticky and covered with dirt and other vegetable matter. Another reason collectors are inclined to pass them by, is the fact that most of them are infested with ants, especially near or among their root clusters. Some few species have even formed special leaves for the home of ants.

Under those conditions the collector should exercise great care and patience, for in these interlaced masses one is likely to discover more than one species of this family, besides other interesting vegetation. A field worker will be exceedingly careful to secure stem, leaves, flowers and fruits from the same plant, because only one of these organs may be specifically distinct, while all its other parts may prove to be identical in structure to already known species. When specimens have become mixed they are difficult to unravel, or a new species may be described from two distinct plants.

Most of our *Asclepiadaceae* are vines, forming tangles upon high trees, twining and rambling over thickets and festooning branches of lower trees or climbing along tree

trunks from the ground up. The majority of them have thick and heavy leaves which also militates against filling one's presses with them, for once they are placed there, they cannot be forgotten if you desire to have a useful herbarium specimen. They are very slow in drying. Quite a number of our Philippine species have a great variation in the shape of their normal foliage leaves from oblong, elliptic to orbicular on the same plant. Most of them, however, bear only one kind of foliage leaves.

Besides this class of green foliage we have on both *Hoyas* and *Dischidias* certain leaves highly specialized to perform a particular function in conjunction with the activities of ants, or these peculiarly shaped leaves may perform a combination of functions. This mutual beneficial relationship of ants to the plant or plant to the ants is called symbiosis. These socalled deformed leaves primarily come under three classes and are usually sessile or nearly so—the plate like leaves, the pouch leaves and the cushion shaped leaves. There may be other types of myrmecophilous leaves.

The foliage of the plate like leaves are nearly circular or reniformly orbicular in shape, bilobed or diphyllous. They are strung along the thick and coriaceous stem and its few branches which creep along the smooth surfaced tree trunks. These leaves are concavo-convex, their edges closely cleave to the surface of the host tree and forming a cavity underneath which the ants use as their home. In this cavity the plant developes a special system of short and rigidly branched rootlets whose function is to absorb the nourishment from the decaying vegetable matter the ants accumulate. This specialized root system covers the inner portion of these plate leaves only and are attached to the stem or its branches at or near the leaf axils. Besides this symbiotic relation between plant and ants, these leaves are of a glaucous green on the outside, appearing

to perform the function of green foliage leaves. The inner or lower side of these thick plates is yellowish brown and more or less tinged with red or entirely deep purple. In our islands both genera, the *Hoya* and the *Dischidia* contain a few species each with these plate like insectivorous leaves and which plants do not bear any other kind of foliage. See *Hoya imbricata Dcne.* and *Dischidia platyphylla Schl.*

The pouches vary greatly in shape and in size, are either single, scattered or in small clusters. Their outside is of a dull yellow, greenish and tinged with red. The inner side of the rigid pouch is usually purple especially toward the base, and the hollowed cavity forms the home of the ants. This cavity is also provided with a system of short and branched rootlets whose function is to absorb the nutriment from the debris the ants accumulate. This class of plants has very slender, terete, wiry and numerously branched stems, which with the branches often twine and hedge among clumps of bamboo. Besides these peculiarly shaped or insectivorous leaves they also bear normal foliage leaves. See *Dischidia saccata Warb.*

The cushion bearing plants seem to grow upon very similar host plants as those bearing pouches or leathery pitchers. Their general twining habitat is also the same. For the cushion, opposing leaves become rounded and their edges approach each other and seemingly close. These specialized pairs of enlarged leaves thicken, become concavo-convex, are reddish streaked externally and are usually deep red colored internally toward the opened base below. By the formation of these leaves the plant offers an inviting home to the ants. In this formed cavity the plant also has a system of rigidly branched rootlets whose function is to absorb moisture and food for the plant from the material the ants accumulate in their homes. These cushion bearing plants also bear normal foliage leaves as those plants with the pouches. See *Hoya darwinii Loher.*

The flowers of most of our *Asclepiadaceae* fall early, and drying them accelerates this. They should be very carefully marked and prepared in the field, so that by the time they come into the hands of scientific men there need be no pauses for doubt.

LIST OF GENERA WITH SPECIES

Asclepias curassavica Linn.

A suffrutescent plant, collected in cogon grass fields at 1000 feet elevation; stems few to several from the same perennial root cluster, ascending, terete, greenish, smooth, less than one half of an inch thick, 1 to 3 feet long, sparingly branched; leaves thinly coriaceous, spreading, somewhat folded on the upper side, similarly pale green on both sides; inflorescence erect, odorless, the stalks and calyx green; corollas reflexed with erect segment tips; anther horns light yellow.

Numbers 5594, 11141 and 15380 collected by *Elmer* at Bauang, Todaya and Irosin.

Centrostemma multiflorum (Blm.) Dcne.

Loose tufts upon stumps or humus covered bowlders, also epiphytic upon living tree trunks a yard or two above the ground in jungles from 500 to 3000 feet altitude; stems several, horizontal or descending, lax, greenish, sparingly branched, arising from the same root cluster, soft and shining, their tips usually ascendingly curved or suberect, with milky juice, subterete, the root mass inhabited by ants; leaves subcoriaceous, nearly flat but tips recurved, mainly divaricate, sublucid, much duller or darker green on the upper surface, not rigid, lower side yellowish green; inflorescence terminal, upon green and subpendant or descending stalks, umbellately clustered, the pedicels slender and yellowish green; flowers pale creamy white, odorless,

deciduous, rather rigid; the yellow anthers turning chocolate brown. Tigbud in Visayan and bagong-bagong in Manobo.

Numbers 7677, 7839, 9438, 9565, 14015 and 15277 collected by *Elmer* at Lucban (2), Dumaguete (2), Cabadbaran and Irosin.

Ceropegia cumingiana Dcne.

A climbing vine upon an inch thick stem in water soaked gravelly soil at 1250 feet altitude or in stony ground of thickets at lower elevation; stem terete, green, twining, occasionally branched and forming tangled masses, one third of an inch thick, very flexible, growing up to 15 feet above ground; blades descending but upon ascending herbaceous petioles, coriaceous, flat, much paler green beneath; inflorescence subpendant from the leaf axils, their stalks dark green, bearing at their ends an umbellate cluster of flowers; pedicels greenish, recurved; flowers soft, pendant, odorless, the tube green or yellowish green, the lobes badeus to atropurpureus in the 5-segmented region including the distal portion of the tube on the exterior. Lopod in Manobo.

Numbers 13344, 15139 and 18407 collected by *Elmer* at Cabadbaran, Irosin and Los Banos.

Clemensiella mariae Schl.

Matting large limbs of lofty trees in moist forested flats at 2000 feet elevation; stem one fourth of an inch thick, terete, green, lucid, a yard or two long, occasionally branched, the free ends drooping; the flat leaves horizontal with tips abruptly recurved, much paler or yellowish green beneath, thickly coriaceous, the ascendingly curved petioles pale green; spikes mostly ascending, the flower bearing portion gray; flowers caducous, rigid, appearing

as closed, green or the calyx tips purple; the corolla also purplish spotted; follicles pendant, pale or yellowish green, terete except for the upper crease or ridge.

Numbers 16374 and 16801 collected by *Elmer* at Irosin (2).—The latter number was provisionally distributed as *Clemensiella dischidioides Elm.* a new name.

Conchophyllum elmeri Schl.

Suffrutescent and pendulous from the lower limbs of trees in open moist woods at 3000 feet altitude; stems 3 to 5 feet long, hanging, terete, as thick as a small lead pencil, greenish gray, quite often branched and thereby forming hanging tangles; leaves thick, rigid, pale greenish yellow, divaricate, the sides vertically disposed, the leaf stalk usually twisted; inflorescent stalks terete, also divaricate, gray; flowers odorless, yellowish, the recurved segments deeper yellow; anthers brown. Satibut-but in Bagobo.

Number 10670 collected by *Elmer* at Todaya.—This is the type number of which only two other topotype collections have been made. It was first discovered by *Copeland* in 1904 and distributed under number 1270, and again by him as late as 1932 under number 19430.

Cryptolepis javanica Blm.

Number 17399 collected by *Elmer* at Irosin.—It is the only specimen of this genus and species known from the Philippines.

Cynanchum denigratum Elm. n. sp.

A twining herb. Stems twining about each other or associated with other vines, forming tangles, terete, nearly smooth, glabrate, light brown when dry, long and slender, occasionally branched, 2 to 3 mm thick. Leaves widely

scattered all along the stems or branches, opposite, mainly horizontally spreading, flat but tips recurved, exceedingly variable in size, glabrous, entire, membranous, the larger blades ovate and 6 by 10 cm, widest below the middle, broadly obtuse or rounded at the base, never truncate to shallowly cordate, gradually tapering from below the middle to the sharply acuminate apex, on my dry specimen of a dark or dusky brown, the lower side paler green when fresh and lighter brown in the dry state, our leaves are all detached but apparently without any foliaceous stipular bracts, the smallest blades are only 3 cm long by one half as wide and are more ovately oblong in shape; petioles glabrous, very thin, subterete throughout, sometimes slightly expanded at the base where it is usually curved, a trifle plane or flattened along the upper side or minutely grooved, leaving roughened scars or seeming glandular brown colored disks after falling, the longer ones 3 cm, the shortest only one third as long; midrib more evident from below, glabrous on both surfaces; nerves 5 to 8 or more numerous on each side of the midrib, faint yet more evident from beneath, strictly ascending, interarching considerable distance below the leaf edge, reticulations obsolete or very obscure. Inflorescence interaxillary or axillary, 2 cm long or shorter, sometimes up to 3 cm long, glabrous; the main peduncle stem like, often with a ring like constriction near its base, seldom rebranched, toward the distal end bearing a cluster of alternating flowers; pedicels puberulent, varying from 1 to 5 mm in length, ascending or divaricate, leaving roughened scars after falling, subtended by minute bracts or ebracteolate; calyx segments 5, with subhyaline rounded apices, persistent, minute; corolla 3 mm long, united at the base, otherwise composed of 5 oblong and free segments which are concave on the inner side and thickened at their tips which are incurved; corona of 2 series, more or less united at the base and inserted upon the inner basal portion of the

corolla; the outer series comprised of 5 oblong and hyaline segments; the inner series more erect and also united, the 5 processes notched at the apex and with a hyaline flap bearing between them dark brown anther like bodies; central column slender, expanded and cleft at the base, wheel like at the top, with short spokes which terminate in blackish brown tips; from each of these distal ends of these radiating projections are a pair of yellowish nearly ellipsoid anthers upon very short filaments. Follicle 2 by 6 cm in the dry state, gradually tapering, leathery, subterete, with a crease along the upper side where it splits open from the base to the apex, ovately ellipsoid and tapering; seeds numerous, in 2 overlapping series, thin, of a rich brown color, subelliptic from the side view, winged, 5 by 8 mm, from the upper end bearing a deciduous tuft of silky white hairs 2 cm in length.

Type specimen number 15636, discovered by *A. D. E. Elmer* in the lowlands near Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916.

In my opinion our material does not seem to be *Cynanchum physocarpum Schl.* nor *Cynanchum schlechterianum Warb.* There are differences in the foliage, in the inflorescence and especially in the fruit.

Dischidia apoensis Elm. n. sp.

Perennial suffrutescent clumps, more or less interlacing upon limbs of a large tree number 10660 which is now considered a new monotypic plant order called "*Sarcospermaceae*". Stems and branches terete, tough, reddish brown to gray; the ultimate branchlets mostly pendant, very slender, smooth, glabrous. Leaves widely scattered, opposite, descending or pendant, flat, dull green to reddish brown, very thick and rigid, much wrinkled and blackish brown on the herbarium specimen, edges entire but rather sharp, oblong to elliptic oblong, broadly obtuse to rounded at both

ends, the larger laminae 4 cm long by 1.5 cm wide across the middle its usual widest portion, the smaller laminae 2 cm long and 1 cm wide, glabrous on both sides; midrib red when fresh and only visible from beneath, nearly obsolete in the dry state; petioles also glabrous, 3 to 5 mm long, usually grooved along the upper side, stout and relatively thick, when dry transversely rugose, leaving conspicuous scars upon falling. Inflorescence axillary or interaxillary, glabrous, the peduncle averaging 5 mm in length and terminated by a divergent pair of bracteated receptacle; these flower bearing portions are about as long as the real peduncle, are terete and heavily or densely clothed with blunt brown colored and persistent bracts; pedicels green, shorter than the peduncles, smooth, subtended by thick blunt bracts or bract like fleshy folds, erect or ascendingly curved; calyx green, persistent to the pedicels, 5-segmented, the short segments are subhyaline and oblongish in shape, rotately spreading; corolla 8 mm long more or less, purplish black or deep purple except around the pink base which is inflated and truncately rounded, gradually tapering to the 5 greenish colored and erect tips, giving it a flask like shape; teeth fleshy, lance shaped, somewhat thickened on the upper side toward the apex, slenderly acute, with short brown colored projections between them and at their bases; corona short and situated in the bulge of the corolla base, the outer segments rounded and subhyaline, the inner erect segments notched at the apex and cartilaginous in texture; stamens minute, dark or reddish brown, situated in between the prongs. Kayup-cup in Bagobo.

Type specimen number 10659, discovered by *A. D. E. Elmer* on a steep ravine along the Sibulan river at 3000 feet elevation, Todaya (Mt. Apo), District of Davao, Mindanao, May 1909.

The flowers of our specimens arise from short thickly bracteated stalks or receptacles, not clustered from the

ends of distinct and smooth peduncles as in *Dischidia joloensis Schl.* which has not been recollected since its discovery many years ago. Also, our leaves are twice as wide and obtusely rounded at both ends.

Dischidia copelandii Schl.

Matting the upper side of large limbs of a *Dipterocarpus* species or of other tree species in secondary or primary forests ranging from 1000 to 3000 feet in elevation, often forming an interlaced covering over dead portions; stems flexible, slender or filamentous, green or nearly sulphureus, branched, taking fine roots at the joints; leaves heavy, glaucous green or more yellowish green beneath, subrotund or cushion like, faintly nerved on the underside; flowers in small clusters, erect, dainty, urn shaped, the small segments recurved, white or nearly so but turning yellowish when old and ready to fall. Sometimes the old leaves are covered with a grayish and nearly orange red rust. Cabalayungan in Manobo.

Numbers 9479, 13533 and 15798 collected by *Elmer* at Dumaguete, Cabadbaran and Irosin. — The last number mentioned was sent out as *Dischidia glaucescens Elm.* a new name. Its smaller, glaucous, less veiny and short but distinctly petioled leaves give it a different appearance.

Dischidia diphylla Elm. n. sp.

Climbing along and around rather large tree trunks. Stem terete, rigid, long and branched, greenish, fleshy, glabrate, much wrinkled longitudinally when dry. The symbiotic leaves scattered along stem and branches in opposite pairs, sessilely attached, finally deciduous, very thick, fleshy, hard to dry and turning brownish black, the shallow concavo-convex plates tightly cleaving to the bark of the host tree, the upper or outer surface of a dull greenish color and in the dry specimen appearing minutely blistery,

the nether side of a dirty yellowish brown or sometimes purplish and covered with fine grayish white granules when dry, both surfaces much wrinkled upon curing, the entire margins usually thinner in texture and tightly attached to its host, on the dry specimens portions of it is bent under while drying, wholly glabrous, suborbicular or more reniform in shape, 6 cm long by 8 cm wide on our largest laminae in the dry state, measuring a little wider below the middle, upper part broadly rounded, the basal portion broad and subtruncately rounded, often with slight projections at the point of attachment; midrib or midvein evident from below, with only a few lateral nerves on each side and which are rather obscure, cross bars or reticulations obsolete; root system rigid, persistent, numerously branched from near the base, in the shallow cavity of the plate like leaves and in which cavity ants make their home and accumulate a mass of vegetable and other matter from which the rootlets absorb nourishment for the plant. Peduncle curing black, exceedingly thick and fleshy, glabrate, wrinkled in longitudinal folds when dry, 7 to 12 cm long or even shorter, straight, axillary, ascending, at the distal end forked or with a cluster of short and thick densely bracteated flower bearing parts; bracts of these receptacles brown and very roughly subtending the scars, persistent; pedicels 5 mm long, glabrous, greenish, early falling and leaving conspicuous scars, subtended by very blunt bracts, minutely puberulent; flowers yellowish, few, fragrant, 5 to 8 mm long, subcampanulate; calyx small, rotate; segments 5, subacute, quite membranous, finely ciliate along the margins and on the back toward the base; corolla united, submembranous, terminated by 5 rather prominently acute teeth which are granularly thickened on the upper side but especially toward their tips; column short and thick, the basal portion surrounded by hyaline scales; the stamineal corona bearing 5 stamens upon very short yet distinct filaments, erect and more or less conti-

guous, around the base of the pistils is a circle of reddish brown sharply pointed processes. Follicles glaucous green when collected, slenderly clavate or cucumber like, immature, glabrous, curing murineus, 5 cm long or longer when mature, subterete, apex bluntly rounded and gradually tapering toward the base.

Type specimen number 15870, discovered by *A. D. E. Elmer* in woods of 1250 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916.

Our specimen does not belong to the genus *Hoya*. From *Dischidia platyphylla Schl.* it is distinguished by its different flowers and leaves, but especially from the former. Its flowers are also very distinct from *Dischidia purpurea Merr.*, but its leaves are quite similar in shape and texture.

Dischidia elmeri Schl.

Hanging tufts upon trees of dense forests at 3750 feet altitude or spread over nearly dead tree tops of a wind swept forested ridge of about the same elevation; stems branched, both flexible, yellowish green, terete, more or less creeping along the limbs, one fourth of an inch thick, the old stems grayish, the pendant or drooping portion freely rebranched and forming dense masses; leaves suberect, thick, quite bendable, concave on the upper side, strongly convex upon the lower side which is yellowish green, the upper surface is darker green; peduncles divaricate or suberect, terete, greenish, bearing few to several flowers at the ends; flowers descending, deciduous, creamy white, curved, more or less flattened, dull yellow. Tangob or tambiayo in Bagobo.

Numbers 10759 and 11221 collected by *Elmer* at Todaya (2). — These are our rarest type numbers and represent the only collections extant. They were discovered nearly thirty years ago, and in all probability will remain

unknown in the great mount Apo forested region for many, many years unless it is collected elsewhere.

Dischidia hirsuta Wall.

Climbing along branches of shrubs of jungle woods or matting limbs of secondary forests at 1000 feet altitude; stem fine and string like, green, very flexible, repeatedly branched, full of milky sap, herbaceous; leaves spreading in all directions, rough papillose on both surfaces, thick and rigid, slightly paler beneath, succulent, the margins somewhat recurved upon the nether side; inflorescence upon axillary and descending spikes which are usually unbranched, the peduncle strongly recurved; flowers single or in pairs but usually solitary, deciduous, greenish white to yellowish, the much bulged basal portion turning wine red when old, the corolla usually light atropurpureus but often with a shade of yellow or greenish to yellow; follicle subterete, pendant, 2 to 3 inches long, more tapering toward the apex.

Numbers 7260, 9264, 12952 and 15799 collected by *Elmer* at Palo, Lucban, Puerto Princesa and Irosin. — This species is comparatively common in most of our islands.

Dischidia irosinensis Elm. n. sp.

Matting limbs of trees in the forests. Stems terete, half woody at the base, wiry or tough, pale green to sulphureus, dull brown when dry, longitudinally wrinkled, glabrous, slenderly curved or closely twining, more or less branched, the branchlets rebranched, main stems few from the same root clusters, the ultimate ones thinner, often with rootlets from the nodes. Leaves opposite, copious, well scattered along the stems and branchlets, flat and rigid, glabrous and similarly green on both sides, ascending or divaricate or even descending, entire, dirty brown or

earth colored on my specimens, in shape varying from oblong to subelliptic or obovate, not spathulate nor seeming orbicular and abruptly constricted into a stipitate base, all leaves more or less similar in size, becoming much wrinkled on both sides while curing, always widest about the middle, cuneate at the base not stipitate, the apex usually rounded or on some of the narrower laminae broadly obtuse, the average blades without their petioles 3 cm long by nearly 2 cm wide above the middle, many of them measure a trifle smaller especially in width; petioles leaving large and rough scars after falling, gradually extending into blades proper, stout, much wrinkled when dry, plane or shallowly grooved along the upper side, persistent to the stem or branches; midvein quite evident on both surfaces, the few lateral nerves relatively obscure and ascending, reticulations few and coarse if present. Inflorescence and infructescence axillary or interaxillary, upon short thick bracteated persistent receptacles; pedicels brown in color, glabrous, 2 to 3 mm long; calyx rotately spreading, with subhyaline margins, also glabrous, persistent, the subacute 5 segments about one third as long as the pedicels; corolla ovoid, pale yellowish brown, as long or a trifle longer than the pedicel, pale and membranous, terminated by 5 erect and acute teeth which have a fleshy tip upon the upper side; central column short and relatively thick, surrounded by hyaline scales; the stamineal column composed of a crown or ring of prongs which appear to bear the minute anthers within their sinuses. Follicles glabrate, sulphureus on the live plant, linear, up to 6 cm in length, terete but with a crease along the upper side, dehiscing the full length, the pair or couple turning to a rich brown on the exterior and a light or yellowish white on the interior when mature, upon stout persistent pedicels and subtended by the equally persistent calyx; seeds in rows, linear, 3 mm long, compressed and winged, brown, bearing at the distal end a silky coma.

Type specimen numbers 17226 and 15797, discovered by *A. D. E. Elmer* in the woods at 1000 feet elevation, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April to September 1916.

Most of the specimens in the herbarium are not typical *Dischidia oiantha Schl.* under which name my material was distributed. In my opinion Bureau of Science numbers 11287 and 12010 collected in central Luzon best matches *Schlechter's* type collected by *Warburg* in northern Luzon. Certain forms of our segregate runs into *Dischidia tonsa Schl.* with oblongish leaves, and it also tends toward a variety with spathulate leaves.

Dischidia lancifolia Merr.

Trailing along the upper side of moss and vine covered limbs of lofty trees in damp forested depressions at 1750 feet altitude; stems slender, yellowish green, smooth, very flexible; leaves rigid and thick, descending, a trifle recurved at the tips, somewhat paler beneath; flowers dark miniatus, yellowish tinged on the interior; pods green, also curved.

Numbers 15848 and 16994 collected by *Elmer* at Irosin (2). — When I first matched my specimens I thought it was distinct from the type specimen of the above name, and so it was sent out as *Dischidia miniata Elm.* new species. More and better material of this is very desirable.

Dischidia livida Elm. n. sp.

Forming loosely tangled masses upon moss covered limbs. Stems very slender or filiform, also very flexible, green, terete, smooth, glabrous, in the dry state minutely wrinkled or winged longitudinally, the very slender branches olivaceus when dry, the older stems dirty brown, relatively wiry, at its nodes forming a fibrillose mass of roots.

Leaves subpersistent, well scattered along both the stems and branches, opposite, flat, mostly descending, rather thin yet quite rigid or subchartaceous, dark green and sublucid on both sides, curing dull green or olivaceus on both surfaces, lanceolate in shape, our larger blades 4 cm long by 1 cm wide a trifle below the middle, most of them on our specimen a little smaller in size but remain the same in shape, the entire margins appearing slightly involute and a little rugose when dry, glabrous, often the lower face is minutely sprinkled with whitish spots, base broadly cuneate, gradually tapering into the sharply acuminate apex; midrib more evident from the lower side, straight, green even in the dry state; nerves 3 to 5 or with secondary ones in between on cach half of the leaf, strongly divaricate or at right angles from the midrib and extending toward the margins, equally prominent on both faces; reticulations very coarse and much less evident; petioles ascendingly curved from the base, very thin or slender, glabrate or sometimes puberulent along the upper side which is faintly caniculate, brown when dry, up to 5 mm in length. Inflorescence axillary; peduncle ascending, strict, arising from the leaf axils, glabrate, 1 to 1.5 cm long on my specimens. brown but more black toward the slightly expanded base, relatively slender, bearing at the distal end a small cluster of livideus colored flowers; pedicels light tan, short or only 1 to 2 mm in length, glabrate, striate, subtended by small brown colored bracts, leaving large scars after falling; calyx segments oblong, shorter than their pedicels, subobtuse, the margins subhyaline, glabrous and drying brown, 5 in number and persistent in the fruiting state; corolla 4 to 6 mm long, tubular but bulged toward the base, terminated by 5 erect and acute small teeth, on the inner side and between them provided with hyaline flaps, the tips on the central side thickened; scales about the ovary column 5, hyaline, short stipitate, ending with a pair of prongs; stamineal column erect,

5-notched, anther bearing in between or on the inner faces, the small reddish brown bodies with hyaline wings four times their length. Follicles dry, dehiscent longitudinally along the upper side, 5 cm long, subterete and straight, very linearly lanceolate, glabrous, the dry ones straw brown, the inner side more yellow and shining in its opened state, its persistent calyx with pedicels upon a 1 cm long receptacle or flower and fruit bearing portion; seeds flat, brown, a few mm long, linear, narrowed toward the profuse coma bearing end.

Type specimen number 16591, discovered by *A. D. E. Elmer* on a very humid forested flat at 3000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July 1916.

The venation of our leaves remind one of *Dischidia merrillii Schl.* and *Dischidia hirsuta Wall.*

Dischidia merrillii Schl.

Creeping along high moss covered tree trunks, subscandent and more particularly hanging in interlaced masses from portions of dry dead limbs, or in limestone thickets of the pine region at 5000 feet elevation; stems very slender or filiform, round, yellowish gray to green, with white sap, glabrate, freely rebranched, the loose tangles in the decayed wood and bark are usually infested with ants; leaves pale green, thick and rigid or the younger ones fleshy, the sharp edges recurved, subpendulous, whitish streaked along the main nerves; the succulent flowers cardinal red or purple with a bluish tinge, upon a short spike which is either sessile or peduncled, the interior of the flowers yellowish red and full of nectar.

Numbers 8559, 9256 and 10042 collected by *Elmer* at Baguio, Lucban and Dumaguete.

Dischidia oiantha Schl.

Number 6336 collected by *Elmer* at Twin Peaks near Baguio.—This material, one of our earliest collections made in 1904 has been considered typical of *Schlechter's* species, and so was given the above name. Since then many collections have been made, besides having before me a carbon copy of the leaves from the type specimen. In the light of this additional information it seems best to consider the above number as identical with my Irosin specimens published elsewhere in this article under *Dischidia irosinensis Elm.*

Dischidia palawanensis Elm. n. sp.

A vine, sprawling over the tops of small trees or among thickets. Stems round or terete, yellowish green to brown, twining, very flexible, 2 to 3 mm thick on my dry specimen, full of latex, the older portions more or less ligneous, the slender twigs or branchlets gray when dry or yellowish brown, glabrous, its long branches curved and occasionally ringed in knots and forms small clumps which bear the insect pouches; these pouches are of unequal sizes and often in a cluster probably due to their age, they are pepper shaped, leathery and rigid, entirely glabrous, dull green, the mature or larger ones of the live ones are 5 cm long, 2.5 cm wide across the thickened base, subterete or subcompressed, narrowed toward the top, apex bluntly rounded, base obliquely truncate or irregularly cordate with the larger portion sublobate or forming a small pouch like projection, at the base attached to a tangle of rootlets surrounding the crossed stem and branches, castaneus on the interior which is hollow and filled with fine roots; these symbiotic leaves are usually filled with dry dead matter which is accumulated by small black ants which find entrance through the basal aperture among the roots and in which pouch the ants feel at home; the normal foliaceous leaves are primarily along the ultimate branches,

opposite, rather sparse, very thick and slightly cushion shaped in the central region on both sides, the young ones glaucous green, turning more yellowish with age, broadly elliptic, 1 by 1.5 cm, obtuse to rounded at both ends, subpersistent, yellowish brown on both sides of my specimens, very much wrinkled, entire, without a midrib or lateral nerves, upon a very short but distinct petiole. Inflorescence alternatingly scattered along slender terminal streamers which are mostly leafless and are pendant; peduncles up to 5 cm in length, ascending, straight, also glabrate and smooth, when dry many ridged or winged lengthwise, the distal end enlarged and bearing a small cluster of flowers; pedicels puberulent when young, 3 mm long more or less, arising from the thickened terete and bracteated receptacle or tubercle which on one of my specimens is 1 cm in length; mature flowers aurantiaceus and rather soft in texture, the suberect pedicels of the same color; calyx lobes 5, only one half as long as the pedicels. the subobtuse teeth with subhyaline margins; corolla broadly bulged below the middle, the ridged neck bearing the crown of 5 small erect and subacute teeth which are more or less thickened and finely ciliate along their edges; the main or central column short and thick, surrounded by broad hyaline scales; stamineal column erect, with an anther in each of its 5 notches, the reddish brown bodies provided with a pair of yellowish transparent wings.

Type specimen number 13101, discovered by *A. D. E. Elmer* in fertile thickets and woodlands at about 250 feet elevation, Puerto Princesa (Mt. Pulgar), Palawan Island, April 1911.

Dischidia saccata Warb. from Davao, Mindanao, has leaves about the same size and shape, but his leaves have a conspicuous midrib and are provided with pronounced lateral nerves at right angles to them. Flowers and insectivorous sacks or pouches are also different.

Dischidia platyphylla Schl.

On living trees; stems long, freely or only occasionally branched, often completely covering the old trunk of their host; leaves in pairs, reniform, tightly cleaving to the bark, well scattered along the stems and branches, subglaucous or yellowish green on the outside, purplish beneath which side is provided with rootlets among which ants make their lodging; peduncles axillary, ascending, a few inches in length; flowers clustered from their ends, mainly pink or with a bluish luster.

Numbers 7143 and 7836 collected by *Elmer* at Palo and Lucban. — *Copeland* first discovered it at Davao in 1904, and his number was used as the type.

Dischidia purpurea Merr.

Upon thin twigs of trees at 3750 feet altitude; roots numerous, yellowish white; leaves imbricate, plate like along the slender stems and branches, coriaceous, convex on the upper side, the lower surface dull purple and with a rigid root system among which ants make their nests; spikes suberect; flowers small, creamy yellow; follicle 2 inches long, also purplish, tapering toward the apex. Sigbut in Bagobo.

Number 11262 collected by *Elmer* at Todaya. — The type specimen of this species was discovered by the author on mount Mariveles.

Dischidia rosea Schl.

A scandent and twining herb, usually hanging upon dry dead limbs or from dead sticks of the Benguet pine region; leaves prominently nerved, thick but with thin edges, rigid and succulent; flowers 1 to 3 from the leaf axils, equally cardinal red all over on the exterior, slightly

paler red on the interior, also rigid and succulent; corolla bulb like at the base where it easily becomes separated; anthers 10.

Numbers 5838 and 7573 collected by *Elmer* at Baguio and Lucban. — The former number is the type specimen and was collected in 1904.

Dischidia ruscifolia Dcne.

Sprawling and forming tangles over nearly decayed limbs, or subscandent on a wind swept forested ridge at 2750 feet altitude of mount Giting and forming clumps at much lower regions, upon cliffs and along rivers; stems repeatedly branched from near the base, terete, quite tough, green or yellowish green toward the ligneous base, the average ones as thick as a slate pencil, with latex; leaves thick and succulent, similarly green on both sides, with pronounced nerves, very numerous, twistingly arranged in between one another, thereby facing the greatest amount of light; flowers solitary or in pairs, axillary, upon slender recurved pedicels, pure white; fruits lighter green, flattened on the upper surface, gradually pointed. Cacabcab in Visaya and agad-agad in Manobo.

Numbers 8741a, 12433 and 14079 collected by *Elmer* at Baguio, Magallanes and Cabadbaran. — The first number cited was wrongly named as *Dischidia myrtillus Schl.* It is a very ornamental plant and should be more extensively grown in our gardens. It is relatively common.

Dischidia sorsogonensis Elm. n. sp.

A climbing vine along smooth surfaced tree trunks. Stems smooth and glabrous, green, wiry, occasionally branched, curing yellowish brown and appearing longitudinally striate, quite thin and long, producing roots under the insect inhabited leaves. The symbiotic leaves well scat-

tered in pairs along the stems and branchlets, opposite, sessile, concave on the nether side, the older ones turning lividus below, glaucous green on the outer convex surface, glabrous, finely wrinkled on the upper side, finely granular or minutely scale covered on the lower side when dry, all reniform in outline or ovately circular, our largest laminae 5 cm long by 6 cm wide below the middle, greatly varying as to age but always of nearly the same shape, the younger plate like leaves on our specimen 1.5 cm across either way, all intergradations but each leaf of a pair of the same size, the entire margins closely attached to its host, curing yellowish brown especially below, the old ones subcoriaceous or submembranous when young, gracefully rounded over the top or apex and around the basal lobes, the base broad and truncate with a slight depression in the middle and a small prominence at the point of attachment, otherwise sessile; midrib most conspicuous beneath, with few basal radiating veins in each half, reticulations also evident from the lower surface; rootlets persistent, many branched, attached to the stem or branches below the leaves, quite stiff, stuffed with debris and inhabited by ants in a mutual beneficial relationship. Inflorescence axillary; peduncles ascending, greenish, glabrous, relatively slender, from 2 to 5 cm in length on my specimen, smooth, at the distal end, bearing a few short bracteated flower bearing receptacles; flowers yellow even so in the dry state, caducous, ovoid; pedicels 1.5 mm long, glabrous. darker brown in the dry state, subtended by bracteoles, leaving scars upon falling; calyx 5-segmented, the segments ovately elliptic, small, glabrous, hyaline; corolla pale yellow, subhyaline toward the base, bell shaped, terminated by 5 short acute teeth whose upper sides are flesh thickened; column short, thick, surrounded by hyaline scales; the stamineal tube or corona erect, surrounding the style with a clavate stigma. Young follicle nearly 4 cm

long, subterete, slightly more tapering toward the blunt tip, creased along the upper side, cucumber shaped, glaucous green but gray when dry.

Type specimen number 15809, discovered by *A. D. E. Elmer* in damp hemp fields at 1000 feet elevation, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916.

It is not *Hoya imbricata Dcne.* or its Philippine variety. The leaves of this material are almost identical to 338 *Copeland,* discovered by him in 1904 at Davao and published as *Dischidia platyphylla Schl.* Differential characters of our new species are primarily drawn from the flowers, the fruits remaining unknown. Also compare our specimens with *Dischidia purpurea Merr.*

Dischidia striata Elm. n. sp.

A profusely matting vine, associated with other creeping and climbing vegetation, on the main limbs of a *Quercus pruinosa Blm.* in humid forests at 4000 feet altitude or upon other lofty trees at lower elevation. Stems very flexible, numerously rebranched and forming dense masses which are very closely attached to the host or support, soft or finely pubescent, on the dry specimen prominently winged longitudinally or striately ridged, the younger ones glaucous red, the old ones yellowish green in the fresh state, filiform throughout, twining, curved, creeping, only a mm thick on the herbarium materials, terete; rootlets yellow, not many, one or two from each node or from the leaf axils, sometimes forked but usually curved and spirally twisted, varying from 5 to 15 mm long. Leaves subsessile, persistent, opposite, rather numerous, well scattered along the stems and along all the branches, thick, pale green or subglaucous green, the younger ones often tinged with red, beneath flat or slightly concave, tightly attached to its support, smooth above and convex, the

entire margin inclined to curve under while curing, broadly ovate or ovately orbicular, most of them 5 mm long and 6 mm wide below the middle or smaller in size, broadly and gradually tapering into the minute apical point, base very broadly rounded, occasionally with a few ciliate hairs on the nether side and along the edges, similarly brown and wrinkled on both surfaces in the dry condition; petioles very short in length and short in pubescence; midrib scarcely evident or obsolete, lateral nerves none. Flowers axillary, from 1 to 3 in a cluster, erect or ascending, pale red or ultimately of a deeper red, the bulge toward the base frequently white or whitish. Follicle dry, at least 2.5 cm long when dry, in pairs and horizontally recurved, expanded toward the base which portion contains the seeds, pale green or yellowish white except the slightly pink colored beak and the edges or wings of the upper flattened side, the lower side convex; beak very slender from below the middle to the fine point, glabrous, tan on the outside but shining lighter brown on the inside of the carpel, subtended by the minutely persistent calyx and upon a short but distinct pedicel; seeds not very numerous, subcompressed, of a rich brown, somewhat narrowed toward the apex which bears a tuftlet of silky hairs which are as long as the beak and compactly enclosed by it.

Type specimen numbers 10481 and 16974, discovered the first number by *A. D. E. Elmer* in the forests at 4000 feet altitude at Todaya (Mt. Apo), District of Davao, Mindanao, May 1909. The second number was also collected by me in the forests at 1000 elevation, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

My material for both of the above numbers was sent out under *Dischidia pubicaulis Schl.* an unpublished name, not *Dischidia copelandii Schl.* to which our plants are very closely related.

Dischidia sylvestrin Elm. n. sp.

Epiphytic upon small trees in very moist woods. Stems long and filiform, green, terete, rebranched, the free branchlets hanging, all curing brown or stramineus. glabrous, longitudinally wrinkled, densely sprinkled with minute whitish colored spots, not inclined to twine but the long free portions pendant in a festoon fashion. Leaves copious, opposite, persistent, more numerous along the ultimate brancoes, also pendant, subcoriaceous when fresh, subchartaceous when dry, pale green, flat on the upper side, the entire margins slightly imbricate and often appearing finely rugose on the dry specimen, curing pale yellowish brown to gray on both surfaces, narrowly linear to lanceolate or very linearly lanceolate, 5 to 8 cm in length without the petiole, 1 cm wide below the middle, often smaller in dimensions especially those toward the ends, gradually and slenderly tapering into the abruptly pointed apex, base subcuneate and subobtusely terminated, numerously and minutely grayish papillose on both sides; petiole 5 mm long or shorter, darker brown when dry, glabrate but papillose, caniculate along the upper side, longitudinally ridged and transversely rugose, persistent; midrib more pronounced beneath, the lateral veins irregular from the base up and coarsely anastamosing; rootlets thin and numerously branched, dense masses at the base of the largest stems, sometimes those parts in contact with its host forming small clusters of roots from the nodes. Peduncles greenish, mainly descending, quite slender, glabrate, rugose and papillose, strict, axillary or interaxillary, bearing at the distal ends a solitary or a forked receptacle or tubercle; these flower bearing portions are sometimes 1 cm long but more often are shorter, thick, terete, with brown scars; pedicels short, subtended by very thin fugacious bracts. Pod or follicle 5 cm long more or less, subterete, gradually pointed toward the apex, the

smooth dry carpel grayish brown on the exterior and shining yellow on the interior, creased along the upper side; seeds dark brown, linearly oblong and somewhat flattened, 1.5 mm long, at the distal end bearing a profuse silvery white coma.

Type specimen number 11401, discovered by *A. D. E. Elmer* in the great mount Apo forests at 6500 feet altitude, Todaya (Mt. Apo), District of Davao, Mindanao, August 1909.

This material was determined as *Dischidia merrillii angusta Schl.*, but the author failed to publish his new variety. In looking over these various type specimens I find no close relationship of our mount Apo plant with *Merrill's* number 3904 from mount Arayat. Our plant is distinctly a high altitude species. *Copeland's* number 1133 was collected in the mossy forests of the same mountain at 6000 feet elevation, and his discovery was made five years before mine. Otherwise this plant is not known, and it seems best to publish it under a new name with specific rank. I think it is our highest alpine denizen of the *Asclepiadaceae* in the Philippines.

Dischidiopsis copelandii Schl.

Herbs in very damp places amongst bowlders along a river or a much branched epiphytic plant with very thick fleshy leaves which are slightly paler beneath and with dull edges; on another specimen the blades are nearly flat, descending, lucid on both sides, dull olive green above, lighter green on the nether surface; stems with flowering stalks terete, smooth, reclining or suberect, succulent, from relatively short and creeping rootstalks, branches very similar; flowers also succulent, white, with purplish red tips; young infructescent head 1 inch long by one half of an inch thick; the seeds are tightly enclosed by a

thick and very lucid green sheath. Biga-na-ihalas in Visayan.

Numbers 7602 and 10445 collected by *Elmer* at Lucban and Dumaguete. — These specimens were distributed under *Conchophyllum copelandii Schl.,* which is now considered a synonym of the above specific name.

Dischidiopsis incrassata Schl.

Number 16853 collected by *Elmer* at Irosin. — The type specimen for this species was discovered on Basilan island.

Dischidiopsis luzonica Schl.

Twining perennial herbs about tree trunks in the damp hemp fields at 750 feet or higher elevation, sometimes forming small tufts on smooth surfaced trees; stems several from a densely matted root cluster, terete, green, flexible, rebranched, the slender and drooping branches interlaced, the longer ones exceeding a yard in length, thickest at the dull green base; leaves thick, descending, nearly flat, not numerous, a trifle paler beneath; peduncles ascending, very pale green; flowers white to cremeus, tips purple to livideus; young fruits descending, yellowish green, rigidly 3-winged although the lower wing is not so prominent.

Numbers 15704, 16123 and 16857 collected by *Elmer* at Irosin (3). — Two of these numbers were sent out under *Dischidiopsis ramosii Schl.* which seems to be identical.

Dischidiopsis parasitica (Blco.) Merr.

Number 18455 collected by *Elmer* at Los Banos. — It was labeled as *Conchophyllum merrillii Schl.* and distributed under that name.

Gymnanthera peduneulata (Miq.) Vill.

Scandent upon jungles of small trees near the seacoast; stems terete, less than one half of an inch thick, flexible and inclined to twine; bark grayish white, smooth, brown on the lax twigs which are rather numerous and form interlaced masses, containing latex; leaves thinly coriaceous, ascending or horizontal, flat, shining bright green above, much lighter on the lower surface; flowers one half of an inch long, greenish white, odorless, soft in texture, subpendulous, the segments rotately spreading; follicles in pairs, 4 inches in length, subterete, tapering toward the apex, opposite at each other. Sagari in Bagobo.

Number 11981 collected by *Elmer* at Todaya. — This is another species only known from the southern Philippines where it is very rarely picked up at sea level.

Gymnema schlechteriana Warb.

Number 17288 collected by *Elmer* at Irosin. — In the Enumeration of Philippine Plants *Merrill* placed my number as *Gymnema lignosum Elm.* under *Gymnema cumingii Schl.* It is, in fact, an exact duplicate of *Warburg's* type number 13001 from Sampaloc, Luzon.

Gymnema tingens (Roxb.) Spring.

Number 17906 collected by *Elmer* at Los Banos.

Heterostemma angustilobum Schl.

A vine, climbing upon and spreading over the tops of woody jungles along the Baruring river at 3000 feet elevation; stems one third of an inch thick, flexible and occasionally twining, all tough, the older ones yellowish, the ultimate branches green; leaves flat, descending, coriaceous, somewhat recurved toward the apex, shining dark green above, very much lighter green beneath; in-

florescence suberect, axillary; stalks and pedicels green, the latter curvingly spreading; flowers odorless, deep yellow, deciduous, the 5 limp perianth segments somewhat greenish on the basal exterior. Tot-ta-tot in Bagobo.

Number 10814 collected by *Elmer* at Todaya. — This is the type material and it has not been recollected since its discovery twenty nine years ago.

Heterostemma herbertii Elm.

Also a vine, climbing along small or larger tree stems, in very humid forested flats; stems one third of an inch thick, subterete though with 2 longitudinal grooves on opposite sides; woody tissue of the older stems soft, pale white, the bark yellowish gray; the longest stem 30 feet and branched toward the top, the long green branchlets arising axillary; leaves horizontal or descending, lighter green beneath, nearly flat, leathery; peduncle also axillary, similar in color, recurved, pedicels alike in these characters: flowers quite rigid, flaveus on the upper more or less blistery surface, paler yellow beneath, plate like or pentagonally wheel like, the buds green.

Numbers 9120, 17661 and 18247 collected by *Elmer* at Lucban and Los Banos (2). — There is some doubt as to the correct determination of the plant from Lucban, and for that reason it was provisionally named *Heterostemma lucbanensis Elm.* It is seldom collected, and the only other typical specimen with some larger sized leaves has more recently come in from the island of Bohol.

Hoya angustifolia Elm. n. sp.

Sprawling along the upper side of large limbs of a huge *Dipterocarpus warburgii Brand.* Stems are long, branched and yellowish green, terete, smooth and glabrous, very tough or wiry, woody toward the base, turning yellow-

ish brown, up to 3 mm thick, the younger branches flexible, the older ones becoming stiff and rigid, taking roots at the nodes, the interlaced branches forming masses on either side of the host limb, the nodes at the point of branching are often enlarged and bearing a coarse cluster of rigid roots. Leaves in opposite pairs, widely scattered along stems and branches but especially along the latter. very thick, descending or pendant, exceedingly rigid and difficult to cure, pale green yet slightly paler or glaucous green beneath, deciduous, narrowly lanceolate, equally tapering from the middle or the widest portion toward either end, apex sharply acute, the entire margin revolute especially toward the base, the laminae 8 to 12 cm long but often only 5 cm, 1 to 1.5 cm wide, much wrinkled on both of the dry sides, most of their faces are numerously minutely grayish white punctate or papillate; midvein scarcely visible on my specimens, lateral nerves obsolete; petioles stout, 1 cm long more or less, very gradually extending into the narrowly cuneate base of the blade proper, black to brown in the dry state, channelled along one side, transversely and longitudinally rugose and wrinkled. Peduncles axillary, arising from the enlarged nodes, strict, stout like the ultimate branches, terete, glabrous, in the dry specimens yellowish brown and wrinkled, 3 to 5 cm long, green when fresh, ascending; tubercle or flower bearing portion very thick, rounded, 1 cm long, brown with conspicuous scars, spicate not forked; pedicels ascendingly curved, similarly greenish white or pale green, filiform, 1 to 2 cm long, divaricately spreading and curved, deciduous, brown and striate; flowers quite rigid, erect, odorless, cremeus, persistent, rotately spreading into 5 acute segments, starlike in appearance, glabrous, short and subhyaline; corolla segments alternating with the calyx, united below the middle, ovately oblong in shape, 2 by 3.5 mm, the acute apices reflexed, grayish puberulent on the

upper side; corona subtended by small very thin scales, sessile upon the corolla, the 5 prominent segments radially spreading; prongs or segments ovate and thick, bearing along their sides a pair of lobes which appear notched or bilobed at the apex; anthers apparently in between and similarly spreading; stigmatic region conically tapering, erect, angular, the blunt tip covered with a fuzzy pubescence. Stalk of the follicles 1 cm long or longer, glabrous and dull brown or blackish; fruit linear, subterete, curved, smooth, the sides strongly recurved when dehiscing, greenish, 8 to 14 cm long on my specimens, more gradually pointed toward the apex than toward the base; seeds brown, flat, linear, 6 mm long, pointed at the base, truncate at the apex to which the long dingy white coma is attached.

Type specimen numbers 16340 and 16916, discovered by *A. D. E. Elmer* in dense woody tangles at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Number 13372 from Cabadbaran was also distributed under the above name, but it is nontypical. The foliage of our proposed new species is very similar to that of various specimens in the herbarium named *Hoya intermedia Schl.* an unpublished species. It is related to *Hoya bordenii Schl.* a broader leafed species and with which our plant was usually associated in jungles bordering lagoons.

Hoya benguetense Schl.

Scandent and matting, the slender stems frequently forming tangles amongst nearly decayed and hanging limbs from large trees near and almost overhanging the river at Sablan; leaves fleshy but comparatively thin, yellowish green beneath, dull green above; flowers also fleshy, hanging by the dull purplish pedicels; the calyx somewhat

purplish on the outside, otherwise pale white, recurved and reflexed in anthesis. Igorots call it umum, the home of ants.

Number 8896 collected by *Elmer* at Baguio. — This is the type number upon which *Schlechter* based his species. It was discovered in 1904 during my first botanical exploration trip to Baguio, Benguet or Mountain province.

Hoya bordenii Schl.

Climbing upon or along a small or medium sized tree trunk in humid forests at 1000 feet elevation or upon dead limbs and branches of live trees at a little higher elevation; stem tough, brown, occasionally branched, the main ones 20 feet long, bendable, taking root at the point of branching, as thick as a slate pencil, sometimes twining, isabellineus and with lighter brown lenticels, the leaf stalks round and thicker; blades heavy, very thick, descending or pendant, much lighter green beneath; the globose floral head upon a 3 inches long descending stalk or peduncle: pedicels slender, subglaucous, the rigid reflexed corolla segments subincarnateus in color, the anthers lilacineus.

Numbers 15829 and 16165 collected by *Elmer* at Irosin (2). — The type specimen was collected by *Borden* in 1904 on mount Mariveles. This region was our first botanical collecting ground before mount Maquiling and mount Banahao were even visited by botanists.

Hoya bulusanensis Elm. n. sp.

A small but rigid epiphyte, creeping and forming bunches along the upper side of large branches or upon inclining tree trunks. Stems flexible or bendable, occasionally branched, that portion near the root ligneous, gnarly at the point of branching, smooth, not wrinkled longitudinally in the yellowish brown state, minutely and numer-

ously punctate, the ultimate branchlets thinner and slender, most of the nodes are enlarged and often with a short crippled branchlet from the axil, very crooked at or near the rigid stiff root cluster, where they cross they form enlargements. Leaves very thick, pale or yellowish green beneath, the upper surface paler green, normally opposite along the slender branches, more or less clustered toward the base or upon very short and thick seemingly abnormal branchlets, subdeciduous, glabrous but minutely punctate on both faces, the dry blades wrinkled on the upper but perfectly smooth on the lower side, flat, edges straight and entire, curing yellowish brown, of two distinct types, the orbicular to rotund shape and the elliptic to the obovately oblong type, the latter ones 2 cm wide above the middle and 4 cm in length, obtusely rounded at the apex, broadly cuneate at the base, the smaller kind 1.5 cm wide across the middle; petiole very short and very thick, curved and expanded toward and at the base, dull brown, rugose on my specimen, leaving large circular scars after falling; midrib scarcely evident or entirely obsolete in the smaller type of leaves, in the middle region longitudinally striate below especially so of the larger blades, lateral nerves none. Inflorescence axillary or terminated by equally short bracteated tubercles or receptacles: pedicles bearing rather rigid and livideus colored flowers, as long if not shorter than the peduncles; calyx spreading, 5-segmented, the lobes glabrous and obtuse to acute, coriaceous, 1.5 mm in length, united at the base; corolla sparsely ciliate pubescent along the margins, otherwise glabrate, united below the middle, the 5 lobes adnate and descending but with inflexed acute tips, about 5 mm long, relatively broad across the middle; corona united to the short column, comprised of 5 radially spreading prongs whose tips are strongly inbent, thick or fleshy, bifid at the tips, alternating in between them are erect linear processes; pistils 2, flask shaped.

Type specimen number 15937, discovered by *A. D. E. Elmer* on a steep forested ravine at 1500 feet elevation, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May 1916.

Our species is a critical segregate from *Hoya bilobata Schl.* based upon 420 *Copeland* from Davao. It should also be compared with the unpublished *Hoya longipes* of the same author. When my distribution was made it was sent out as *Hoya diversifolia Elm.*, an untenable name since *Blume* had already used it.

Hoya camphorifolia Warb.

Dangling masses from limbs and branches of trees in forests of a depression at 1000 feet altitude; stems several, arising from an ant nest, isabellineus, bendable, not numerously rebranched; leaves rigid, descending, pale green on both sides, tips strongly recurved; inflorescence pendant, the pedicels dull purpureus, the petals similar in color; stamens deep red.

Numbers 15244 and 15803 collected by *Elmer* at Irosin (2). — Type specimen discovered by *Warburg* in middle Luzon, no number cited.

Hoya ciliata Elm. n. sp.

A suffrutescent climbing vine upon small trees or shrubberies. Stems 1.5 cm thick, terete, green but mixed gray, only sparingly branched from above the middle, the slender yellowish green branches drooping, yellowish brown in the dry state, wrinkled and minutely pubescent, 5 mm thick on my specimen. Leaves divaricately hanging, opposite, well scattered along the free ends or ultimate branches, very shallowly concave on the yellowish green lower surface, shining deep green above, rigid and very thick, edges involute and marginal rim compressed, ciliate beneath,

sparsely ciliate on the upper side, curing yellowish brown on both faces, finely wrinkled on the upper side, smooth or obscurely wrinkled below, deciduous, elliptic in shape or ovately so, broadly rounded at the base, broadly obtuse toward the apex and finally constricted into a short tooth like point, the larger blades 6 cm across the middle and 12 cm long without the petioles, occasionally considerable smaller; petioles stout, 2 cm in length, curved from the expanded base, compressed and grooved along the upper side, densely yellowish brown pubescent, leaving large scars after falling; midrib stout, straight, more evident and pubescent beneath, caniculate and sparsely ciliate above; lateral nerves 5 to 7 on each side, obscure from both faces, strictly divaricate. Peduncles curvingly suberect, arising from between the leaves from the lower side of the branch or twig, also green, light tawny and densely soft pubescent on my type, 5 cm long or longer or even much shorter; flowers clustered and spreading from the distal end of the peduncle; the pedicels averaging 3 cm in length, sparsely ciliate, strict or curved, dark brown but green when fresh, usually ascending and arranged in whorls; the sepals 5 to 8 mm across, broadly orbicular, a little broader than long, the basal central part coriaceous, the marginal portion subhyaline and minutely ciliate, the ventral side glabrous, the dorsal side with only a few ciliate hairs; corolla leathery, nearly black when dry, rigid, the larger of the 5 segments 1 cm long, united below the middle, the sharply acute apex inflexed, glabrous on both sides, persistent as is also the calyx; column very short and thick, subtended by minute scales; stamineal horns 5, erect, rigid, yellowish brown, the short oblong lobes rounded at the apex. Fruits not known. Tumagisig in Bagobo.

Type specimen number 11072, discovered by *A. D. E Elmer* along a dry wooded ridge of the Baracatan creek at

1500 feet altitude, Todaya (Mt. Apo), District of Davao, Mindanao, July 1909.

Apparently it has not been recollected and cannot be matched with any specimens in the herbarium. It is characterized by its ciliate pubescence of the stems, nether side of leaves and calyx margins. Some of my material was sent out under *Hoya rotundisepala Elm.* new name.

Hoya crassicaulis Elm. n. sp.

Climbing along the interlaced stem of a strangling fig species. Old stem the size of a small finger, subligneous, terete, crooked, repeatedly branched, very tough but stout, reaching up to 7 m above ground, more or less gnarly at the point of branching, the main stems curved and occasionally twisting, that portion on my dry specimen only 5 mm thick, barely bendable, smooth and glabrous, curing a dirty yellowish brown; lateral branches short, many of them very thick and roughened with large leaf scars. Leaves deciduous, opposite or in clusters, descending, exceedingly thick and consequently very rigid, shallowly conduplicate, strongly recurved toward the apex, the fresh ones yellowish green but paler beneath, glabrous on both surfaces, oblong, gradually tapering into the rather sharply acute to subacuminate point, base obtusely rounded to broadly cuneate or rounded, varying from 10 to 17 cm long without the petioles, from 5 to 8 cm wide across the middle or a trifle below it, oblong but occasionally ovately oblong, the entire margins often pressed minutely involute, the upper side sublucid, curing similarly dull yellowish brown on both faces; midrib region thickened especially toward the base, longitudinally wrinkled in the dry leaves; nerves several from each side, oblique, not very evident but more so on the upper surface, otherwise wrinkled not reticulated; petioles brownish on the live plants, glabrous, much wrinkled or rugose and yellow

when cured, channelled along the upper side, 1.5 to 5 cm in length, thick and fleshy, leaving very large and circular scars upon falling, persisting to the blades, a trifle thicker toward the base which is frequently curved. Flowers fragrant, forming a globose cluster from the terminal leaf axils of stems and branchlets, dull except the purplish brown perianth tips; peduncle 5 cm long more or less, appearing minutely papillate or punctate, earth colored, ascending; pedicels 1.5 to 2.5 cm long, filiform, pale yellowish brown; calyx segments 1.5 mm long, narrowly oblong, subhyaline except the reddish brown acute tips, besides the 5 outer lobes there are a pair of inner ones; corolla rotate, united at the base, also hyaline, glabrous, membranous, 5 mm long and as wide across the middle, the upper half strongly inflexed, the acute apex prominent; horns of the corona 5 and alternating with the corolla lobes, wheel like, ovately oblong and with a pair of pockets in their sinuses. Follicle dry, dehiscing along the upper side, terete, linear, 12 cm long on ours; seeds 3 to 5 mm long, compressed, pale brown, obtusely rounded at the base, at the truncate apex bearing a dingy white coma.

Type specimen number 14440, discovered by *A. D. E. Elmer* climbing a balete in the hemp region at 250 feet elevation, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

Our specimens are probably most closely related to *Hoya incrassata Warb.* Compare it with my number 16718 from this same locality and which number I now consider that of *Warburg's* species. Our new species here described should also be critically examined with Bureau of Science number 834 collected by *Foxworthy* on Palawan. The shape, size and venation of this small but critical group of *Hoya* species with thick leaves must be carefully considered. There are some plants almost identical in foliage,

yet so different in flowers, and we can only imagine what ripe fruits will reveal.

Hoya cumingiana Dcne.

Number 6419 collected by *Elmer* at Baguio. — This species bears quite characteristic foliage and was discovered by *Cuming* on Mindoro.

Hoya gracilis Schl.

Forming mats upon branches of *Quercus pruinosa Blm.* growing in damp woods at 4000 feet elevation; stems rigid, numerously branched, green but ultimately turning brown; leaves spreading, rigid, thick, pale or yellowish green beneath, with age becoming softer and wrinkled, deep green and grooved upon the upper side, occasionally turning reddish; inflorescence upon descending terminal stalks; pedicels curvingly deflexed, nearly red; flowers pendant, deeper red, odorless and also rigid. Aputulibung in Bagobo.

Number 10482 collected by *Elmer* at Todaya. — This determination may not be correct when compared with the type of *Schlechter's* Celebes plant.

Hoya incrassata Warb.

Number 16718 collected by *Elmer* at Irosin. — It was erroneously determined as *Hoya crassicaulis Elm.* and was sent out under that name. It is a close match to *Warburg's* species.

Hoya imbricata basicordata Koord.

Tightly climbing or cleaving to smooth surfaced medium sized trees of the hemp region at 1000 feet elevation; stem wiry, occasionally branched and forming root-

lets; blades very thick and rigid, plate like, atropurpureus on the lower concave side which is provided with a rigid root system and among which ants live in a symbiotic relation with the plant, the upper outer convex side is mostly of a dull glaucous green; pedicels also green, very flexible; the odorless flowers with much recurved petals which are velvety and creamy white on their inner sides at least.

Number 15802 collected by *Elmer* at Irosin. — Rarely collected but not rare nor inaccessible.

Hoya leytensis Elm. n. sp.

Densely matted and tightly cleaving to tree trunks. Stems numerously rebranched, glabrous, terete, minutely and densely tubercled, the old ones turning to a dark russet brown, the ultimate branchlets free and quite slender, greenish and much lighter brown in the dry state, obscurely striate. Leaves coriaceous and subglaucous, more or less persistent, glabrous, opposite or in subwhorles at the ends of abortive branchlets, quite variable in size and shape, entire, narrowly oblong to rotund, most of them are from 2 to 3.5 cm long and from 6 to 10 mm wide across the middle or widest portion, the rotund ones measure 10 by 12 mm, the normal or the oblong blades equally tapering toward both ends, obtuse to subacute or even rounded for the smaller rotund to elliptic blades which are in the minority, flat, grayish to brown on my dry type specimen; midrib quite fine or obscure, plainer on the lower surface, lateral nerves none, only the upper side marked with faint transverse lines; petioles 3 to 5 mm long or much shorter, dark brown, crinkly rugose when dry, leaving orbicular flat scars upon falling. Inflorescence upon very slender peduncles 5 cm long or when in anthesis much shorter; flowers pendant from the thickened bracteated ends of the stalks, in umbels and dark or dull yellow when fresh;

pedicels filiform, 5 to 8 mm long, smooth, light brown on my specimen; calyx very small, the 5 hyaline segments spreading, oblong with obtuse tips, 1.5 mm long or even shorter; corolla united below the middle, the upper half with the acute apex strongly reflexed, minutely puberulent on the upper or ventral face, broadly ovate in shape; the column exceedingly short; corona prongs radially spreading, each of the 5 prongs bilobed at the apex and with ciliated processes between the sinuses or of a ciliate rim around the pistil, bluntly ovate to oblong. Pod or follicle very slender and linear, glabrous, pale brown, smooth, upon short pedicels with persistent calyx, slenderly tapering toward both ends, subterete, usually curved; seeds pale brown, 4 mm long, flat and grooved along its sides, gradually tapering from the bluntly tapering base to the truncate apex which bears a tuft of whitish hairs.

Type specimen number 7261, discovered by *A. D. E. Elmer* crawling along small tree stems and branches near the sea level at Palo, Leyte, January 1906.

Its leaves are approaching those of *Dischidia tonsa Schl.* but inflorescence is entirely distinct. Bureau of Science number 19333 collected by *Wenzel* at Dagami of the same island is apparently the same species.

Hoya mcgregorii Schl.

Climbing along middle sized tree trunks in damp flats; stems flexible, pale green; leaves also rigid and paler beneath; flowers pale white, their points pink.

Numbers 13066 and 17969 collected by *Elmer* at Puerto Princesa and Los Banos. — The first number was distributed as *Hoya cagayanensis Schl.* an unpublished name. The determination of the second number is not certain, for its leaves are very much like those on *Hoya obscura Elm.*

Hoya meliflua (Blco.) Merr.

A very rigidly branched and suffrutescent plant, usually overhanging cliffs or rock ledges along creeks and rivers at low elevation; leaf blades very thick and fleshy; flowers also fleshy, dark purple.

Numbers 7262 and 17782 collected by *Elmer* at Palo and Los Banos. — Both of these numbers were distributed under *Hoya luzonica Schl.* a synonym.

Hoya mindanaensis Elm. n. sp.

Branched vines, climbing over dense jungles along creeks and river. Stem terete, curved, occasionally twining, the size of a lead pencil, flexible, glabrous, smooth and yellowish, containing latex, the heavy but slender branchlets green and hanging, tan color when dry, the older one sublucid and ridged longitudinally, the ultimate branches relatively thin. Leaves opposite, persistent, scattered, mainly descending, thickly coriaceous, yellowish green beneath, tips recurved, otherwise nearly flat or only the entire margins slightly imbricate, also glabrous and smooth, curing subolivaceus on both sides, oblong or more often ovately oblong, base broadly rounded and sometimes obscurely emarginate, the upper portion of the laminae gradually tapering into the acute to subacuminate apex, the average blades 15 cm long by 6 cm wide across the middle or a trifle below it, persistent; midrib thick and pronounced beneath clear into the apex and olivaceus in color, on the upper face deeply and narrowly grooved, totally glabrous on both surfaces; nerves faint, 3 to 5 on each side of the midrib, slightly ascending and straight, forked from above the middle and reticulately united, sometimes with secondary nerves in between, reticulations coarse and only visible from beneath; petioles up to 2 cm in length, blackish brown on my dried specimen, also thick,

rugose, glabrous, caniculate along the upper side, persistent, leaving a triangularly shaped scar after falling. Inflorescence faintly odorous, upon 8 to 12 cm long green stalks; peduncles arising from the upper side of the stem or twigs between the leaves, terete, descending, with few short hairs, becoming glabrate, very minutely ridged lengthwise and minutely tubercled; pedicels umbellately spreading, as much as 5 cm in length, likewise terete and green when fresh, very seldom dull purple on the exposed sides, very slender, glabrate when old, it with the peduncle nearly black in the dry state; dry flowers flat and blackish; sepals 5, green but drying nearly black, very linear, 5 to 7.5 mm long, minutely puberulent, radially spreading; corolla broadly ovate in general outline, the apical portion strongly inflexed, their lateral sides appearing as horned lobes, finely tubercled on the outside, the inner surface covered with a yellowish gray felt or tomentum, apex acute, united toward the adnate base and thereby forming a short and very thick tube or column, the larger ones almost 1 cm long, not quite so broad, dirty white and with yellowish tips; horns of the corona glossy, very rigid and thick, ascending, 5 or as many as corolla segments, pouch like, with a blunt recurved point and on the inner and upper side with a pair of sharply pointed processes; the stamens located on the inner basal parts and inclosing the pistil or rather the stigmas. Baluntine in Bagobo.

Type specimen number 10829, discovered by *A. D. E. Elmer* in the woods along the Sibulan river at 3000 feet altitude, Todaya (Mt. Apo), District of Davao, Mindanao, June 1909.

This species has not been recollected since its discovery, and although it was originally determined many years ago as *Hoya angustisepala Schl.* he never published it. My specimens were sent out under *Schlechter's* name but it is here published under the above new name. Notice the

great difference between the sepals of this plant and that of *Hoya ciliata Elm.* collected in this same general region.

Hoya mindorensis Schl.

Number 10267 collected by *Elmer* at Dumaguete. — *McGregor* originally discovered this species on Mindoro in 1905. Besides our collections it is not known.

Hoya obscura Elm. n. sp.

Epiphytic and apparently forming tangles. Stems branched from near the root cluster, woody at or near the base, 5 to 8 mm thick, terete, glabrous, dull yellow on the older ones, cremeus and winged on the very slender final branches, the main branches often opposite and quite rigid, provided with longitudinally winged ridges; main roots crooked and rigid, ultimately finely rebranched. Leaves scattered along all the branches, opposite, falling. glabrous, smooth and glossy especially on the upper side, entire, diverse in size but not in shape, flat, elliptic to obovately oblong in the longer ones, the smaller subelliptic blades 2 by 3 cm, the others up to 10 cm long and nearly 4 cm wide across the midde or a little above this, gradually tapering to the acute to subacuminate apex, the smaller ones are broadly obtuse at the base, the largest leaves cuneate, sometimes slenderly cuneate, all gradations between these extremes, similarly curing yellowish brown to grayish on both sides; midrib not prominent, very shallowly depressed on the upper face, straight from the base to the apex; lateral nerves faint, 3 to 5 on each half of the leaf blade, quite oblique especially the basal ones, obcurely forked and more or less anastamosing at their ends, reticulations none; petioles 5 to 10 mm long or even up to 1.5 cm in length, likewise glabrous, dirty brown and rugose when dry, caniculate on the upper side. Peduncle

stout, coriaceous, wing like ridged lengthwise, 5 cm long more or less, curved, usually arising from the leaf axils, terminated by a much thickened tubercle or flower bearing portion; flowers not large, numerous, brown on my specimen; pedicels also glabrous, striate, filiform, most of them curved and thereby forming tangled masses, subtended by bracteoles, finally deciduous, up to 1 cm in length; calyx composed of 5 rotund hyaline segments, scarcely more than 1.5 mm long and about that in width; corolla adnate and united toward the base, subhyaline, the upper or inner surface slightly fuzzy gray, ovate and with acute tips recurved; horns of the corona 5, suberect, small, with minute appendages from their inner basal portion; stamens surrounding the 2 flask shaped erect pistils.

Type specimen number 16719, discovered by *A. D. E. Elmer* at Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July 1916.

Our material does not very well agree with *Hoya gracilis Schl.* from the Celebes and published in Bot. Jahrb. 40 not 50 as cited in the Enumeration of Philippine Plants. *Schlechter's* new variety from the Philippines was never published. Compare it also with *Hoya mcgregorii Schl.* and its allies. Our leaves have a lucid or a glossy appearance even when dry, and are very much like those on *Conchophyllum elmeri Schl.*

Hoya odorata Schl.

Scandent, a rope like liana, associated with other vines along the upper moss covered inclining tree trunks at 3000 to 4000 feet elevation; stem the size of an ordinary lead pencil or as much as three quarters of an inch thick, comparatively flexible but tough, severally branched, covered with yellowish bark, taking root from the lower side; branches pendant or descending, not numerous, occasion-

ally divaricately rebranched from near the base of the stem, lax and slender, smooth, the younger ones greenish, the older ones turning yellowish, with latex; leaves also descending, flat and coriaceous, relatively thin, lucid, tips strongly recurved, darker or duller green above, the lower surface usually concave; flowers axillary, similarly disposed, nearly white, not rigid, the several spreading pedicels purplish, buds cremeus; pods or fruits chiefly terminal, smooth, green, terete, hanging.

Numbers 9587, 17121 and 18041 collected by *Elmer* at Dumaguete, Irosin and Los Banos. — Its general features are very similar to that of the unpublished *Hoya eugenioides Schl.*

Hoya pubifera Elm. n. sp.

A crawling perennial upon a half decayed log, the older parts branched. Young stems herbaceous, slender, curved and inclined to twine, yellowish brown, soft and minutely velutinous, subterete, covered with very small papillae. Leaves opposite, widely scattered, thick or leathery, curing grayish to yellowish brown, entire, the edges sometimes pressed with involute margins, narrowly oblong or oblanceolate to narrowly spathulate, velutinous beneath as well as densely or numerously papillose, the upper surface very similar but only slightly pubescent, the average blades 12 cm long by nearly 3 cm wide at or above the middle, the base attenuate, apex obtuse to subacute, a few of my detached leaves are only 6 cm long by 2 cm wide and with both ends obtusely rounded; midrib not conspicuous, lateral nerves none; petioles 1 to 3 cm long, dark yellowish brown, leaving circular scars upon falling. Peduncle stout, erect or nearly so, 4 cm long, similarly papillose and of a rich yellowish brown tomentum on my specimen, terminated by a number of pedicel scars.

Type specimen number 16971, discovered by *A. D. E. Elmer* in woodlands at about 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Even though I failed to secure flowers or fruits, my specimens were distributed under this new name which is here described from leaf characters only. Compare it with Bureau of Science numbers 17603 and 20500.

Hoya pulgarensis Elm. n. sp.

A creeping or twining epiphyte, in woods and along shrubberies. Stems curved, occasionally twining, round but in the dry state coarsely ridged or wrinkled longitudinally, 5 mm thick or thicker on the yellowish green specimens, sparingly branched, the terminal branchlets considerably thinner, densely soft pubescent throughout, yellowish brown when cured. Leaves deciduous, scattered, opposite, mostly descending, thick and leathery, elliptic, base rounded but not cordate, apex also rounded but terminating into a short apiculate point, margins entire and strongly involutely pressed, soft and densely pubescent beneath, glabrate or only strigose on the upper side, curing yellowish beneath and brownish above, my larger blades 5 by 9 cm but most of them smaller, widest across the middle, the upper surface much wrinkled, obscurely so on the lower face; midrib thick, pronounced beneath, depressed above, similarly pubescent and alike in color; lateral nerves 5 to 7 on each side, obscure, divaricate, straight, in the dry leaves more evident from the upper side; reticulations not evident or obsolete; petioles very thick, 1 to 1.5 cm long, sunken along the upper side, ridged lengthwise, covered with the same yellowish brown pubescence, leaving large more or less circular scars after falling. Inflorescence upon rather short axillary peduncles which are also rugose and hairy; pedicels of the

flowers 1.5 cm long, severally clustered, light tawny tomentose, erect or ascending, subtended by short densely tomentose bracteoles, relatively slender and somewhat enlarged toward the distal end; calyx united at the base. 5-segmented, the lobes overlapping and broadly ovate, 4 mm long and a little broader toward the base, concave on the upper glabrate side, on the outside short but densely pubescent throughout, apex broadly obtuse; corolla with 5 lobes, adnate, 7.5 mm in length, ovate but with acute apex which is inflexed and thickened along the midvein region on the upper glabrate side, the dorsal side of the lobes minutely pubescent; column very short and very thick, at the base apparently surrounded by a fleshy rim with finely ciliate edges; the crown of 5 horny prongs erect, strongly ridged, erect and enclosing the pistil, broadly elliptic in shape; anthers small, upon fleshy membranes, conniving over the stigma.

Type specimen number 12985, discovered by *A. D. E. Elmer* at near sea level, Puerto Princesa (Mt. Pulgar), Palawan, April 1911.

This material was sent out under *Hoya coronarioides minor Schl.* apparently an unpublished name. Its leaves approach those of *Hoya incrassata Warb.* but its flowers are totally different, if the determination of 4082 *Merrill* is correct. So again, its leaves are very similar to *Hoya ciliata Elm.* only the flowers are so very distinct from either.

Hoya pulgarensis Elm. is from the southern Philippines on the China seacoast, while *Hoya ciliata Elm.* a closely related species comes from the southern Philippines on the Pacific coast side. So also, two similar species of *Dischidias* with insect pouches come from these widely separated parts of the southern Philippines. Compare *Dischidia palawanensis Elm.* with *Dischidia saccata Warb.*

Hoya quinquenervia Warb.

Epiphytic and only sparingly branched upon large trees in a forested ravine at 1000 feet altitude; stem inclined to twine as in most other species of *Hoya* and *Dischidia*, bendable, isabellineus in color, smooth, the old petioles of the same color; leaves flat but egdes revolute, equally green on both faces, sublucid; pedicels purpureus, quite flexible; flowers flaveus, minutely sprinkled with purple, apparently rigid and rattling when violently shaken; stamens whitish.

Number 15804 collected by *Elmer* at Irosin. — Since *Warburg's* discovery of this species in the province of Isabela, northern Luzon, it has not been recollected until it appears in this my Sorsogon collection of southern Luzon.

Ischnostemma carnosum (R. Br.) M. & R.

Number 12023 collected by *Elmer* at Mati. — It was distributed under the genus *Cynanchum*.

Marsdenia tinctoria R. Br.

Scandent and suffrutescent plants on large tree trunks of forests at 4250 feet altitude and south of the Sibulan river, or in among jungle vegetation at lower elevation; stems as thick as a slate pencil or thicker, very strong and tough, bendable, green or brownish, loosely branched and forming a pendant network; blades upon green and ascending petioles, subcoriaceous, deep green above, much paler beneath, the flat sides usually recurved; inflorescence erect, upon axillary spikes, the stalks green; flowers sweetly odorous, at first nearly white but turning yellow or bluish with age; stamens nearly of the same color; old follicles 3 inches long, one half of an inch thick below the middle, acuminately pointed. Lamoos in Bagobo.

Numbers 6068, 8249, 10539 and 16993 collected by *Elmer* at Baguio, Lucban, Todaya and Irosin.

Sarcostemma brunonianum W. & A.

Number 5991 collected by *Elmer* at Baguio. — A curious plant with many green branches but without leaves.

Secamone multiflora Dcne.

Number 6398 collected by *Elmer* at Twin Peaks near Baguio. — The type specimen of the above species is 1284 *Cuming* collected in a province of central Luzon. My specimens are considered typical.

Secamone rectinervis Schl.

A climbing shrubby vine in jungled woods along a well drained ravine at 1500 feet altitude, or a tree climber at 5000 feet elevation; stems one half of an inch thick or sometimes only one half of that, round or terete, very flexible, subtwining, crooked, most of the branchlets toward the top, occasionally with nodular rings or conspicuously nodulose; bark brown when old, lenticelled, with a flow of latex; the long main branches rope like, greenish; petioles terete, green, ascending; the leaves rigidly coriaceous, shallowly conduplicate, paler or yellowish beneath, chiefly descending, flat, deep lucid green above; panicle terminal or subterminal, ascending or horizontal and from between the leaves on the upper side of the stems; the pedicels with calyx greenish, the petals white but soon turning yellow; stamens also yellow.

Numbers 12521 and 16964 collected by *Elmer* at Magallanes and Irosin.

Secamone urdanetensis Elm. n. sp.

Climbing upon a medium sized tree and forming tangles in the axils of the limbs. Old stem subligneous,

terete, branched, very tough, twining and making masses; the branches also twining, long, curved and here and there twisting, slender, dark brown as are also the main stems, the puberulence of the same color, in the dry state longitudinally ridged, 2 to 3 mm thick on my specimen. Leaves numerous, well scattered, coriaceous or subchartaceous, flat or shallowly folded, paler green beneath, persistent, opposite or toward the flower bearing portion single and opposed by inflorescent branches, the upper surface murineus when dry and glabrous, much paler beneath and more or less flecked with minute very dark brown scales, most of them 4 cm wide by 7 cm long without the petioles, nearly all of the same size and shape, broadly elliptic or obovately elliptic, occasionally subrotund. apex rounded and terminated by a very short and sharp point, base also rounded but sometimes broadly obtuse, widest across the middle or just above it, more tapering toward the base than toward the apex, entire; midrib pronounced beneath, dark brown and with a similarly colored puberulence, sunken along the upper face and with a few short hairs; lateral nerves 3 to 5 on each side, ascending, tips forked and interarching, brown as the midrib but very sparsely provided with ciliate hairs or minute scales, when old glabrous, faintly visible from the upper surface; reticulations fine, quite evident from the lower side, not evident on the upper surface; petioles measuring 1 to 1.5 cm. long, flat and grooved along the upper side, strongly curved upwardly, somewhat thickened at the base, leaving large semicircular scars upon falling, stout. deep chocolate brown pubescent. Inflorescence cymose, strung along the terminal branchlets, deep brown pubescent throughout, axillary or leaf opposed, variable in size from 3 to 5 cm across, branched from near the base or from below the middle, divaricately spreading, all the stout stalks and branches dull green, persistent, the ultimate short branchlets subtended by broad and ovately oblong bracts;

flowers in terminal clusters, with an unpleasant odor, persistent; pedicels subrecurved, thick, only a few mm in length, similar in color and pubescence, subtended by persistent bracteoles; flowers turbinate; calyx segments erect, 5, united at the base, puberulent, linearly lanceolate, coriaceous, about 3 mm long; corolla a few mm longer, united below the middle, also erect, the lobes broadly oblong, glabrous but flecked with minute reddish brown spots, the apical portion of the lobes irregularly wrinkled and subhyaline; stamineal crown short and basal, surrounding the pistils. Kibay in Manabo.

Type specimen number 13587, discovered by *A. D. E. Elmer* in humid forests at 750 feet elevation at or near Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August 1912.

The leaves of our specimens remind one of *Gymnema mariae Schl.*, otherwise distinct.

Streptocaulon baumii Dcne.

Numbers 5549 and 6768 collected by *Elmer* at Bauang and Lamao.

Streptocaulon corymbosum Elm. n. comb.

Anodendron corymbosum Elm. Leafl. Philip. Bot. II, 512. — Scandent shrubs in copses of hot dry places along the Bued river near camp Colgan or Twin Peaks. Stems smooth, green when young, brownish when old; leaves subcoriaceous, lighter green beneath; flowers dark purple; sap milky. Udog in Igorot.

Type specimen number 8468, discovered by *A. D. E. Elmer* near Baguio in March 1907. A critical comparison with 1024 *Cuming* will separate it from *Streptocaulon cumingii (Turcz.) Vill.*

Telosma crispipetala Elm. n. sp.

A suffructescent climber and rambler. Stem or portion of a branch olivaceus green, compressed, 5 to 7 mm thick, terete in the fresh state, when old glabrate, minutely striate and puberulent. Leaves distantly scattered, opposite, deciduous, subcoriaceous, paler green beneath, thin or membranous in the dark or yellowish brown state, very diverse in size, entire, our largest laminae 15 cm long by 10 cm wide below the middle, ovate in general outline, the smallest blades 8 cm long by 5 cm across the middle, gradually tapering from the middle toward the very sharply pointed acuminate apex of our larger ones, the apex of our smaller leaves merely acute, base of our larger leaves prominently cordate, the base of the smaller ones shallowly cordate; midrib more prominent beneath than above, smooth and glabrous, yellowish brown on the lower face; lateral nerves ascending and ascendingly curved toward their anastamosing ends, 4 to 6 on each side of the midrib, similar in color; reticulations fine and rather coarse, yet plainly visible from the lower face; petioles 4 cm long on the smaller leaves, twice as long on the larger leaves, slender, soft and herbaceous, yellowish brown when dry, smooth, usually curved at the slightly enlarged base, broadly channelled along the upper side, smooth and glabrous. Inflorescence yellowish brown throughout on my specimen, pendulous from the leaf axils, subpaniculate but with opposite or whorled branches, smooth and glabrous, up to 15 cm in length and nearly as wide above the middle; the peduncle and main branches quite slender but especially the latter, the ultimate branchlets filiform and subwhorled, subtended by thin and sharply pointed bracts of various sizes; flowers yellowish in the live plants, upon 5 mm long thread like pedicels which are subtended by minute bracteoles, opposite, in whorls or in umbels; calyx united at the base, the 5 lobes spreading, hyaline, nearly

2 mm in length, ovately lanceolate, acuminately pointed, the margins sometimes very minutely ciliate; corolla also united around the base, more erect but usually curved or crooked and overlapping and intertwining, glabrous, not ciliate along the edges, subhyaline, 6 mm long more or less; the 5 lobes or segments linearly lanceolate but with rather broad bases, the margins toward the apex conspicuously crisp like or minutely wavy or undulate, tips usually recurved; stamineal crown upon a very short basal column, the stamens erect and with blunt processes, surrounding the pistils.

Type specimen number 9101, discovered by *A. D. E. Elmer* in thickets or jungles at 1500 feet altitude, Lucban (Mt. Banahao), Province of Tayabas, Luzon, May 1907.

Related to *Telosma parviflora Merr.* from Siargao island. Part of my material was first sent out under *Tinospora.*

Telosma procumbens (Blco.) Merr.

A woody climber upon trees in woods and forests of fertile soil at 1500 feet altitude; stems flexible, round, one half of an inch thick, covered with a thin greenish bark; branches long, far reaching and overtopping trees, terete, green; petioles ascending, the laminae portion submembranous, horizontally spreading, flat or shallowly conduplicate on the upper much darker green surface, tips abruptly recurved; inflorescence subpendulous and greenish throughout, odorless; petals more yellowish green, doubly twisted toward the left.

Numbers 10345, 11121 and 15612 collected by *Elmer* at Dumaguete, Todaya and Irosin. — The first two numbers were distributed under the genus *Pergularia.*

Toxocarpus glaucus Dcne.

A climbing and twining frutescent vine, covering the tops of small or medium sized trees standing upon a gravelly creek bank at 750 feet altitude; stems one half to three fourths of an inch thick, terete, bendable, tough; bark yellowish gray, smooth but when old scaling in very thin and small plates, otherwise latericeus, the inner portion of the bark contains milky sap; leaves scattered along the branched stems, coriaceous, flat and recurved at their tips, dull green above, much lighter or even yellowish green beneath; inflorescence axillary, the stalks green, the bracts and calyx tips purplish tinged; flowers pendant, odorless, early falling, soft not rigid, the twisted segments citrineus, the basal portion stramineus; follicle similar to a pair of horns, round, dark green, each 3 inches in length.

Number 13014 collected by *Elmer* at Puerto Princesa. — The type was collected by *Cuming* on Mindoro. Compare it with the next species.

Toxocarpus gracilis Dcne.

Number 12028 collected by *Elmer* at Mati.—Type specimen 1559 discovered by *Cuming* on Mindoro island is exceedingly similar to *Toxocarpus glaucus Dcne.* from the same island, and for that reason my number from Mati may be either species or entirely different.

Toxocarpus merrillii Schl.

Number 18296 collected by *Elmer* at Los Banos.—This species was originally discovered by *Merrill* at Bosobosa in 1903. My collection from just across the Laguna de Bay from its type locality is the only time it has been rediscovered in this entire bay region within thirty five years!

Toxocarpus rubricaulis Elm.

Numbers 15587, 17289 and 18297, discovered by *A. D. E. Elmer* in the parang vegetation of the foothills at Irosin

(2) and Los Banos.—The first two numbers were provisionally sent out as *Toxocarpus sorsogonensis Elm.* new name, but which I now consider the same species as that with the characteristic red stems.

Tylophora clemensiae Schl.

Number 17192 collected by *Elmer* at Irosin.—No doubt our specimen represents the same species as 529 *Clemens* from Lake Lanao and which specimen is only a fragment of the inflorescence with small leaf like bracts. The leaves of my distributed *Tylophora floribunda Elm.* are more than twice as large and with a profuse inflorescence, yet I think it is the same as *Schlechter's* species.

Tylophora elmeri Schl.

Number 5980 collected by *Elmer* at Baguio.—These rare specimens represent the type collection, and has only once been collected since its discovery in 1904.

Tylophora lucida Schl.

Climbing among other vines upon large tree trunks in dense moist wooded flats at 2000 feet elevation; stem the size of an ordinary lead pencil, occasionally rebranched, long, flexible and strong; the woody tissue is sulphureus, bark smooth and yellowish brown; leaves descending, nearly flat, much lighter green beneath; twigs or branchlets long, dark green, very smooth; inflorescence ascending, also green, lax, the calyx of the same color, otherwise the floral parts are atropurpureus; fruits pale green, terete, fusiform.

Number 17034 collected by *Elmer* at Irosin.—The type specimen for this species was discovered on mount Mariveles.

Tylophora luzonica Schl.

Number 5585 collected by *Elmer* at Baguio.—This is also a rare type collection and is very seldom recollected.

Tylophora perrottetiana Dcne.

Matted upon shrubs and fence hedges; stems and branches smooth, green and climbing by twining; leaves subcoriaceous, similarly green on both faces; pods or follicles yellowish green, pendulous.

Number 8933 collected by *Elmer* at Baguio.—This material was distributed as *Tylophora merrillii Schl.* which is now reduced to a synonym.

Tylophora setosa Schl.

Scandent upon large shrubs or small trees of humid woods or forests at 4500 feet altitude on the Talon side of the mount Apo mountain range. Lambad in Bagobo.

Number 11962 collected by *Elmer* at Todaya. — This is another very rare plant, only known by its type number discovered by me nearly thirty years ago.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. X Manila, P. I., May 8, 1938 Art. 132

IROSIN FREYCINETIA

by

A. D. E. ELMER

—x—

Freycinetia bulusanensis Merr.

A small tree climber; stem or stems 0.5 of an inch thick, terete but crooked, rigid, 20 feet high, tough, greenish brown, ridged, smooth or occasionally with a dull spine, branched all along but especially forming a densely entangled mass toward the top; branches rebranched, dull green, relatively slender, descending or drooping, 1 to 2 yards in length; leaves flexible but coriaceous, descending or recurved, slightly paler beneath, rather numerous along the branchlets, caniculate above, midrib ridged beneath; fruiting heads globose, 1 inch in diameter, normally 3 from the twig ends, erect but becoming subpendant, flesh red when mature.

Numbers 14978 and 16294 collected by *Elmer* in moist ground of a densely wooded ravine at 1750 feet elevation.—It was distributed as *Freycinetia vulcanica Elm.* a new species.

MISSOURI BOTANICAL
RECEIVED
JUL 6 1938

148

Freycinetia cuernosensis Mart.

Climbing along tree trunks and over rotten stumps or snags; stem terete, 2 to 3 inches thick, crooked or curved, distinctly ringed, subglaucous to yellowish gray, 20 feet long or high, few and short branched toward the top; branches also thick, the longer ones rebranched and forming coarse tangles, curved and with tips erect or ascending; leaves coriaceous, densely crowded toward the ends of the twigs, paler green beneath, conduplicate toward the base, recurved toward the apex; the stipular bracts green and falling off or rather tearing off; spikes 3 to 5, terminally clustered, suberect or recurved, heavy, nearly 2 inches thick, 10 inches long, yellowish red, upon stout erect 1 inch long stalks or peduncles.

Numbers 16314 and 14914 collected by *Elmer* in wet stony ground along a stream bank of a densely wooded gulch at 1500 feet elevation.

Freycinetia curranii Merr.

A scandent shrub; stem 1 inch thick or thicker, 15 to 25 feet long, only occasionally branched; branches long, drooping and ascendingly curved toward their leafy tips; leaves coriaceous, descendingly curved especially toward their ends, caniculate above toward the base, the sides recurved, numerous and densely crowded, paler beneath; the flowering bracts snow white except the wine colored tips and the similarly colored basal portion of the leaves subtending the erect inflorescence; spikes yellowish brown.

Number 16590 collected by *Elmer* in jungled woods along a ridge at 3000 feet altitude.

Freycinetia irosinensis Elm. n. sp.

Climbing and matting a large dead tree stump; stem or stems 10 m high, repeatedly branched, divaricate or

descending and with ascendingly curved tips, averaging 3 cm thick, terete, rather long, sparingly rebranched, numerously marked by the leaf scars or transverse rings; leaves in three twisting and dense rows, profuse, ascending from the base, then recurved and their terminal portions drooping, dry or chartaceous, the basal portion deeply caniculate, paler green beneath, curing brown, nearly 3 cm wide, 7 dm in length, very slenderly pointed, edges of the apical portion strongly involute in the dry state, finely serrate or sharply so toward the ligule; midrib smooth and slightly depressed, minutely keeled and finely serrate beneath, toward the tip forming one of the serrated triangular edges; ligule not expanded, the basal portion of the blades broadened and imbricately overlapping, usually one side of it extended into a sharply pointed tooth or lobe, the basal portion of the laminae proper only slightly narrowed; floral bracts very unequal, rigid, the inner ones yellow and bract like, the outer ones subfoliaceous and brick red; inflorescence dioecious; staminate spikes linear, usually 3 and erect from the ends of the twigs, 10 cm long including the 2 cm long more or less compressed stalk; the stamens are brown in the dry state, inserted upon a murineus colored and somewhat flattened receptacle; main stalk of the pistillate flowers hard, terete, ringed; heads or spikes suberect, terminal, 4 to 5-clustered; secondary stalks or peduncles 3 or more cm long, erect, yellowish when fresh, dull brown when dry, stout, the upper side flat or nearly so, the sides or edges scurfy especially toward the top; floral spike nearly 3 cm thick, yellowish but turning wine red when mature, narrower in the dry state, 12 to 20 cm long, the longer ones usually somewhat curved; flowers of the syncarpia 1 cm long, dense and numerous, their contiguous portion very dark brown when cured and sharply angular; the apical portion angularly wrinkled or ridged, lighter brown when dry; stigmatic portion bluntly raised, slightly

overtopping the lower portion, the 5 to 7 stigmas flatly grouped and encircled by a shining callous ring.

Type specimen number 16430, discovered by *A. D. E. Elmer* in light woods at 750 feet elevation, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June 1916. — To be compared with *Freycinetia scabripes Warb.* and its synonym.

Freycinetia jagorii Warb.

A tree trunk climber and associated with other vines; stem or stems yellowish brown, 0.5 to 0.75 of an inch thick, terete, crooked, hard and rigid, mainly branched toward the top or 20 to 30 feet above the ground; branches rather long, slender, numerously rebranched, conspicuously ringed, yellowish gray; twigs also slender, lax, descending but with ascendingly curved tips; leaves coriaceous, paler green beneath, descending and gracefully twisted in a recurved fashion, sublucid above; inflorescence and infructescence terminal; heads green, scattered, 2 to 3 inches long by 0.5 of an inch thick at least in the field; bracts of the male flowers thick, concavo-convex, luteus; peduncle divaricate, stramineus; the smooth powdery spikes descendingly curved and chalky white.

Numbers 16210, 15057 and 15378 collected by *Elmer* in wet rocky ground of very humid depressions at 1000 and up to 2750 feet in elevation.

Freycinetia luteocarpa Elm. n. sp.

Few to several stemmed rambling or suberect shrubs, not scandent; stems rigid, terete, nearly 1.5 cm thick toward the base, few branched from below the middle; wood porous, whitish, covered by a smooth but dull green bark which turns brown when dry, provided with blunt spines; branches descending, crookedly rebranched; twigs green-

ish, light brown when dry, marked all along by ringed leaf scars; leaves ample, scattered along the entire length of the branchlets, slightly paler green beneath, flat, when dry unequally brown on its sides, horizontal or descending, flat except the recurved apex, nearly lanceolate or narrowly linear, submembranous, 1 to 1.5 dm long, up to 1.5 cm wide across the middle, gradually tapering to the sharp apex, margins entire of finely serrate but scabrid toward the narrowed base which is a trifle expanded and firmly clasping along the twigs; midrib smooth on both sides, more evident on the upper darker brown surface, the lateral nerves faint yet quite evident upon the lower side; inflorescence or infructescence terminal, upon short erect stalks which are usually subtended by foliaceous bracts of various sizes and which bracts have expanded bases for clasping purposes; heads or spikes 3 to 5-clustered, their stalks erects; the fruiting portion elongated, terete, 2.25 cm long or much shorter, less than 1.25 cm thick, cylindric to subellipsoid in shape, erect or nearly so; peduncles upon a short erect stalk, curved at the base where it is flattened on the upper or inner side, 2 to 3 cm long, stout, pale green, brown to grayish in the dry state, subterete except at the expanded base, often curved or slightly twisted toward the distal end, 2 to 3 mm thick, densely covered with spicules above the middle especially toward the top end; drupes short, sharply angular on the contiguous sides, the apical or exposed portion bluntly pointed or conical, with few to several ridges terminating at the stigmatic portion which is blunt or subtruncate, the brown 1 to 3 stigmas surrounded by sublucid callous rims, exactly luteus when fully ripe.

Type specimen numbers 16016, 15930 and 15394, discovered by *A. D. E. Elmer* in loose stony ground of a very steep and humid wooded ravine at 1750 feet elevation, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May

1916. — Number 15394 was distributed as *Freycinetia membranifolia Elm.* a new species and its floral characters are not included in the above diagnosis.

Freycinetia maxima Merr.

Climbing along a tree trunk; stem at least 1.5 of an inch thick, crooked, 20 feet high, few short branched toward the top; leaves thickly coriaceous, ascending from the base which in the younger ones is provided with broad purplish stipules, finally recurved, much lighter green beneath, those subtending the infructescence fiery red at the base; fruits erect, usually 3-clustered, upon 3 to 5 inches long stalks; common peduncle 0.75 of an inch long, flattened on the inner side; fruiting cones 6 inches long, subcompressed, usually recurved, 2 inches across at the middle, red when mature.

Number 14697 collected by *Elmer* in wet earth of damp woods at 2000 feet elevation.

Freycinetia multiflora Merr.

Climbing along the stem of a tree; stem 0.5 of an inch thick, repeatedly branched, 20 feet high or long; branches forming masses, the longer free ones descending from the base and ascendingly curved; leaves ascending, the midrib depressed along the upper side, slightly paler beneath, rigidly coriaceous; infructescence upon short stalks, erect, terminal; the green secondary stalks or peduncles shorter than the common basal one; cones usually 3, terete, 6 inches long, 0.75 of an inch thick, red, usually somewhat curved outwardly.

Number 14699 collected by *Elmer* in very wet ground of a wooded depression at 2000 feet altitude.

Freycinetia negrosensis Merr.

A tall tree climber; stem 2 inches thick, terete, 30 or more feet high, repeatedly branched especially toward the top; the branchlets short and ascending, 1 inch thick, greenish; leaves rigidly coriaceous, ascending, densely crowded in 3 rows, blackish brown at the base, only slightly recurved toward the tips, similarly dull or subglaucous green on both surfaces, curvingly channelled toward the base; the inflorescent leaf bases yellow, not red; heads 2 to 5-clustered, erect or ascending, dull green, 5 to 8 inches long, 0.75 of an inch thick, upon 2 inches long stalks or peduncles.

Number 16161 collected by *Elmer* along a forested ridge at 1750 feet elevation.

Freycinetia pandanicarpa Elm. n. sp.

A medium sized tree climber; stems terete, crooked, 2.5 cm thick, ringed with leaf scars, occasionally with blunt or conical spines, branched from the middle; branches many, rebranched, terete, the ultimate ones 0.5 cm thick, ring like marked; twigs ascendingly curved; leaves erect or ascending, subchartaceous or rigidly coriaceous, in 3 rows, very numerous, their bases tightly imbricated, tips gradually recurved, slightly paler beneath, curing equally light brown on both sides, 5 to 7 dm long, 1.5 cm wide across the middle, very linear in shape, gradually and slenderly tapering toward the apex, a trifle narrowed toward the rolled in or strongly conduplicate upper side, the edges finely serrate except the sharply toothed margins toward the base; the sheath like or basal portion of the leaves 5 to 8 cm long, widest at the base, smooth, thick and rigid, deeply folded and closely clasping one another, shining reddish brown on the outside but soon turning blackish brown when exposed, entire, the small truncate

ligule scarcely evident; midvein narrowly keeled and sharply serrate on the nether side, narrowly grooved along the upper surface, the numerous lateral nerves scarcely visible from below; infructescence terminal, upon a subterete 1.25 cm thick common stalk which is densely marked by transverse rings; the 3 peduncles erect, perfectly smooth and glabrous, flattened along the inner face especially toward the base, pale green but light tan when dry and with minute transverse checks, 5 to 8 mm thick; spikes varying from 8 to 18 cm in length, usually 3-clustered, strictly spicate, on my specimen 2 cm thick toward the base which appears a trifle larger in girth than at the apical portion, are also erect to ascending or divaricately spreading, terete, straight not curved in the fresh state; syncarpia very fructiferous, almost 1 cm long in the mature fresh condition, forming a solid mass; apex conical, with 4 to 7 angles and with as many stigmas on the irregularly circular truncate top, light brown when dry but when collected yellowish to red; seeds very numerous, minute, narrowly oblong in shape, compressed or slightly angular, glabrous, the spindle shaped central portion dull reddish brown on our dry specimen, its lateral sides of a distinctly lighter brown color.

Type specimen number 13683, discovered by *A. D. E. Elmer* in wooded areas and upon steep ravines at 2500 feet elevation, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916. — *Freycinetia superba Mart.* and *Freycinetia subflagellata Elm.* are its nearest allies.

Freycinetia sorsogonensis Elm. n. sp.

A rather small tree climber; stem 1.5 cm thick, terete, 8 m long, mainly branched toward the top; branchlets less than 1 cm thick, glabrous, reddish or yellowish brown when dry, the leaf scars on the twigs prominent and somewhat oblique, more or less connected by conspicuous longi-

tudinal winged keels or ridges; blades almost entire, with only a few widely scattering serratures on its edges along the middle portion of the leaf, linearly lanceolate, rigidly coriaceous, curing equally dull or grayish brown on both surfaces, the widest ones 2 cm at the middle in the dry state, gradually tapering to a fine point, toward the base also somewhat narrowed and only one half as wide, not strictly conduplicate nor clasping at the base, its margins entire; ligule apparently present in the early state, very thin and fugacious; midvein not conspicuous, smooth, not serrate beneath, the lateral veins more visible from the lower side; bracts subtending the infructescent branchlets rather numerous and subpersistent, the lower ones 1 cm long, the uppermost three times as long, obtuse to slenderly acute, entire, their basal portion imbricate and clasping, rather thin in texture, grayish brown when dry, easily becoming detached and leaving ridge like scars; infructescence terminal, erect, sometimes upon short specialized twigs, usually from the ends of the regular branchlets, upon a short stout common stalk which on our specimen bears closely set conspicuous transverse rings; the colored leaf like bracts usually subtending the inflorescence were not seen; peduncles 3, bearing as many fruiting heads, 3 cm long, comparatively slender, erect or ascending, glabrous or smooth, triangularly expanded at the base, subcompressed along the upper side, persistent; heads when young distinctly elongated, when fully ripe ovoid or subglobose from external appearance, our mature head 3 by 4 cm, our young one ovoidly oblong, green, yellow to red; the syncarpia reddish brown when dry, minutely spotted, oblongish, lacerating and becoming detached at and from the base, angularly ridged at the top and terminating into a short beak; the 4 to 7 stigmatic portion truncate and subcrustaceous; seeds very numerous, linear, straight or frequently slightly curved, light brown and with a whitish lateral portion extending from tip to tip.

Type specimen number 15833, discovered by *A. D. E. Elmer* in humid forests at 1000 feet elevation. Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916. — Its relation is between *Freycinetia warburgii Elm.* and *Freycinetia rostrata Merr.*, but amply distinct from either.

Freycinetia sphaerocephala Gaud.

Climbing along the lower side of a large tree trunk; stem less than 0.5 of an inch thick, terete, brown, ringed, branched all along up to 20 feet above ground, very rigid and hard; branches descending, a yard long or much shorter, occasionally the larger ones rebranched; leaves in 3 rows, mostly horizontally spreading, quite rigid, equally green on both sides; fruits terminal, dark green and apparently immature, globose.

Number 14920 collected by *Elmer* on a well drained wooded ridge of compact soil at 1250 feet altitude.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. X Manila, P. I., May 18, 1938 Art. 133

IROSIN ARACEAE

by

A. D. E. ELMER

—x—

Aglaonema alpinum Elm. n. sp.

A succulent perennial herb. Stem usually solitary, creeping or rather reclining at the base and bearing fleshy roots, dull green, terete, 1.5 cm thick at the top, nearly twice as thick toward the base, erect, 3 to 5 dm long or the most vigorous ones even longer, the upper portion very rough by the old leaf scars, 1 cm thick and much wrinkled in the dry state. Leaves primarily ascending, subcoriaceous, several, terminating the stems or their branchlets, alternatingly crowded and clasping; laminae horizontally spreading, curing similarly brown on both sides, dull and much paler green beneath, upper surface evenly deep green throughout or without the paler green blotches, entire, thin or subpapyraceous in the dry state, gradually tapering into the acute to subacuminate apex, base obtusely rounded, glabrous, slightly inequilateral, oblong, 5.5 cm wide across the middle, the blade portion three times as long, those on my specimen of nearly equal size; petioles 5 to 8 cm long, erect or ascending, also glabrous, brown when dry,

MISSOURI BOTANICAL RECEIVED JUL 6 1938

14

gradually expanding toward their imbricating basal portion, the subhyaline margins decurrently extending upward along the petiole to within 2.5 cm from the blade; midvein more conspicuous beneath, of a deeper brown; lateral nerves 4 or 5 on each side of the midrib, much ascendingly curved, faint and only seen on the nether side, with numerous secondary filiform nerves between them. Inflorescence arising from the lower or older leaf axils, erect; peduncle yellowish green in the fresh condition, succulent, terete, glabrous, when dry brown as the petioles and appearing flat, slender but gradually thickened toward the base, 3 to 5 cm long in anthesis, twice as long in the fruiting state; flowering spathe 4 to 5 cm long, descending upon or from a recurved peduncle, linearly lanceolate, straight, gradually tapering, glabrous, early falling, curing light brown, 1.5 cm wide toward the base, the sides inwardly folded, clasping at the base, subhyaline except for the numerous fine reddish brown striae; the flower bearing column or spadix well surrounded by the spathe, mainly pistillate, the basal portion sterile on our examined specimen, the female flowers in a terminal glomerule; florets or ovary sessile, of unequal sizes, sprinkled with minute spots, ovoidly elliptic, terminated by a short thick stigmatic point. Fruit or drupes smooth, sublucid, luteus when collected, ellipsoid, 1 cm long or longer, also sessile, terminated by the persistent stigma.

Type specimen number 16520, discovered by *A. D. E. Elmer* in very wet humus covered stony soil of densely wooded flats at 3000 feet elevation, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July 1916.

It is not *Aglaonema oblongifolium (Roxb.) Kunth.* a lowland plant, nor the cultivated *Aglaonema commutatum Schott.* Our species is strictly alpine, its leaves curing brown not black, has shorter petioles, different spathes and with smaller yellow colored mature fruits.

Aglaonema philippinense Engler

Notes for 15706 and 14993: — Succulent herbs in black wet earth of a wooded depression among herbaceous thickets at 1000 feet; stem 1 inch thick, terete, herbaceous, green or grayish on the older decumbent portion, dirty brown on that portion lying on the humus covered ground, occasionally branched, the leaf bearing portion suberect; leaves ascending, alternatingly crowded toward the end; petiole 6 to 10 inches long, dark green, ascending, the greater length grooved above, expanded at the base, dark green; the laminae portion also ascending, heavy, lighter green beneath, above dark or dull green with whitish green blotches along the middle portion of the sides, slightly inequilateral, the short tips recurved; infructescence 3 to 5-clustered from the leaf axils, the green subterete stalks ascending or divaricately spreading, bearing a loose cluster of fruits; young drupes light yellow, the mature ones shining vermillion red, ellipsoid, nearly one half of an inch long, containing a large stone seed surrounded by a watery meat.

Number 14993 was distributed under *Aglaonema latifolium Engler* but which appears to be the same as the above named species.

Alocasia heterophylla (Presl) Merr.

Notes for 16344: — Succulent perennial herbs in wet soil among stones along the bottom of a deeply shaded ravine at 1000 feet; rhizome tapering from the base to the 1 inch thick leafy tip, ascendingly curved, few inches long, bearing many fleshy roots whose dirty ends terminate with angular hard nodules; petioles erect, yellowish green but atropurpureus mottled, broadly sheating and imbricate at the base, 1 to 1.5 foot long, more or less winged, channelled toward the base along the upper side; blades coriaceous, ascending or horizontal, paler green beneath;

peduncles terete, ascending, outwardly curved toward the top, 5 to 8 inches long; spathe erect, pale green, thickened at the base and constricted above this, the upper portion becoming divergent; the basal portion of the spadix with few female flowers, the shining ovaries green, the stigmas cremeus; staminate spadix melleus, subterete, gradually tapering from the base to the blunt tip, rugosely marked; the basal portion of the male spadix as well as the apical portion of the female spadix of a chalky white, the plated portion neither male nor female in character.

Alocasia macrorrhiza (Linn.) Schott

Notes for 15455 not given.

Alocasia talihan Elm. n. sp.

Terrestrial and perennial. Root stem in the ground, not above it and forming a caudex. Leaf petioles 1 to 2 m in length, broadened toward the base, ascending; the laminae portion about as long as the petiole, coriaceous, glabrous, also ascending, subglaucous green beneath, margins coarsely wavy, curing similarly brown on both sides, ovately triangular in general outline, broadly bilobed at the base, sinus conspicuous, tips of the lobes broadly obtuse, the middle portion gradually tapering to the acute apex; midvein striate, more pronounced beneath, with about 7 pairs of lateral veins, all darker brown when dry, rather straight and ascending, their tips united into a fine submarginal nerve, usually with very fine intervening secondary veins, cross bars and reticulations slenderly filiform. Peduncle obscurely triangular toward the base, 30 to 50 dm long or longer in the larger ones, 3 to 5 cm thick, green, erect at first, 1 to 3 from the inner leaf axils; spathe leathery, also erect, 3 dm in length even on my dry specimen, the basal or subfusiform portion sterile, deep green in the fresh state, when pressed 4.5 to 7.5 cm thick across the

middle, narrowly oblong to broadly linear, about 10 cm long or longer, erect and more or less enclosing the entire inflorescence, gradually tapering to an erect sharply acuminate point, minutely punctate and purplish red toward the top especially on the ventral or inner side, persistent, dull yellow above the cavity but gradually turning to a flesh red; spadix terete, linear, extending from the tubular bowl which is viscid on the inside clear into the apex of the spathe, 1.25 cm thick and 18 cm long on my dry specimen, the basal 4 cm plated portion gradually extending into the reddish brown flat plates which are oblongish and irregularly angular; male spike dull yellow, somewhat thinner than the basal portion of the spadix, 2 cm thick when fresh; anther plates light yellow, flat, very irregular; anthers about 4 mm long, pendant from the plates, linear and normally 10 in number; the oblongish plates toward the sterile base are reddish brown but gradually changing to the cremeus colored male flowers.

Type specimen number 17381, discovered by *A. D. E. Elmer* in hemp plantations at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

It is not *Alocasia macrorrhiza (Linn.) Schott* and probably not *Alocasia.* The natives or Bicolanes call it talihan and plant it for the root stems which are said to be edible.

Alocasia maquilingensis Merr.

Notes for 16181: — Solitary clumps in wet earth of open humid places or upon steep slopes of woods at 1000 to 2000 feet in altitude; caudex short, several inches thick, white and spongy; leaves several, ascending and spreading; petioles 3 to 5 feet long, the basal one third grooved and winged along the upper side which portion is bright green, otherwise terete and greenish brown, 3 inches thick at the bottom, only one half of an inch at the distal end; blade

flat, coriaceous, a trifle shorter than its stalk, triangular, horizontal or little ascending; peduncle cremeus below, greenish toward the top, subterete, 0.5 of an inch thick and a foot long or longer; spathes 5 inches in length, erect, centrally clustered, terminal, diverse in age; the limb or the upper two thirds linearly oblong, yellowish and occasionally purplish streaked, becoming deflexed and finally separating; the basal one third of the spathe pistillate and tightly folded and forming a tubular or ovoidly elliptic cavity, leathery in the fruiting state, 2.5 of an inch long by one half as thick; staminate flowers crowded in the middle section of the spadix which is terminated by a 2 inches long yellow appendage; seeds brown, the inner sides plane and angular, outer sides rounded, subglobose, covered by a yellowish to fleshy red membrane.

Our specimen is nearly glabrate and is a much larger plant in all respects than *Merrill's* type from mount Maquiling, and it was therefore distributed as a new species under *Alocasia vulcanica Elm.* The natives or Bicolanes distinguish it from the valley biga by calling it the mountain biga.

Alocasia zebrina Koch & Veitch

Notes for 14911: — Rank succulent herbs in wet humus covered ground among bowlders of humid woods along a creek at 1250 feet; caudex or stems herbaceous, terete, 1 to 2 inches thick, decumbent, very seldom branched, 6 inches to a foot long, with numerous fleshy fibrous roots; leaves few to several, 2 to 5 feet high; stalks terete, caniculately sheathed toward the base along the upper side, one half to one inch thick, smooth and shining but strongly mottled; blades coriaceous, nearly horizontal, much duller green above, greatly varying in size; fruits thickly ellipsoid, few to several from the terminal portion of the stem

or caudex, dark green; the stalks erect, one foot long, similar in shape and markings to the petioles.

Amorphophallus campanulatus (Roxb.) Blm.

Notes for 14809: — In loose ground of steep wooded hillsides at 1000 feet; stems roughened, strictly erect and perfectly terete, throughout soft but tough, 1 to 2 inches thick, mottled like a snake, a yard high, at the top bearing a few large leaves which are ternately rebranched and divided into divaricate and submembranous leaflets which are similarly green on both sides; flowering stalk short in the early state, when in fruit a foot long or longer, erect, also terete and mottled; spathe of the flowers hood like and folded or much corrugated, flesh red or reddish brown, fugacious, strongly odorous; spike terminal, erect and terete, 1.25 of an inch thick, 3 to 5 inches long; individual fruits diverse in size, compressed ellipsoid, pale white, with brownish apical portions, ultimately luteus, the slender styles more or less persistent.

By experience I can say that the grayish to green and yellowish colored mottled stem has on more than one occasion been mistaken as that of a reptile and consequently has given me to suffer reflex shocks. And the odor emitted by the spathe covering the spadix at a certain time of their flowering period is very much like that of a carrion.

Colocasia esculentum (Linn.) Schott

Notes for 15096: — In swampy ground or planted in wet soil along streams, in and around springs or in seepage places; short stems or corms terete, 2 to 5 inches thick by 3 to 7 inches long, dirty brown and roughened on the outside as well as with numerous fleshy and white colored roots; meat like a potato, mealy, white and with a slight tinge of purple; leaves few to several, erect; petioles averaging a yard long, terete but below the middle deeply

grooved along the upper side, sheathing at the base, green but dull purplish tinged; blades mainly descending, submembranous, glaucous green beneath, dull purple on the upper side at the petiole; fruits or infructescence dull green, fusiform, 1.5 of an inch long, slightly recurved, upon 1 to 1.5 foot long terete and erect stalks similar to the petioles; usually only two or a pair of peduncles arising from the axils of the leaves.

Generally cultivated and in the Philippines it is primarily known as gabi, the corms or tubers of which are commonly found in most of our vegetable markets for sale. Very similar plants of the *Arum* group yield the pantropical taro root.

Cyrtosperma merkusii (Hassk.) Schott

Notes for 15234: — Dense jungles in muddy ground bordering small lakes at the base of forested ridges at 750 feet; clusters dense and large, 3 to 5 feet across; trunk or caudex entirely submerged, 1 to 2 feet thick and as long, erect, the younger individual tussocks arising laterally and much smaller than the central or parent stump, all bearing a profusion of lateral fleshy yellowish brown roots, the meat of the trunk herbaceous and yellowish white; petioles green, terete, sliced on the inner side toward the ground, smooth except the basal portion which is provided with sharp and short ascending spines, varying from one half of an inch to 6 inches thick at the base and from a yard to a rod in length; blades ovately triangular in shape, many, erect, of various stages, more than one third of the basal portion lobed, coriaceous and heavy, smooth, the larger ones 7 feet long by 5 feet wide across the widest portion or at the sinus; inflorescence or infructescence arising from the center of the individual clusters, strictly erect, their stalks or peduncles similar to the petioles and from 1 to 2 yards in length; spathe 1.5 to 2.5 feet long, 5 to 8 inches thick,

erect from the end of the peduncle, subterete except the outwardly opened portion, very thick and rigid, margins quite sharp, the constricted point also erect, sulphureus on the inner side and streaked with greenish veins, on the outer shining surface atropurpureus and with yellow nerves except the totally yellowish base; spadix rounded, 2 inches thick, 1 to 1.5 foot long, upon a short yellowish green stalk or stipe, fumoseus in color, the upper one half apparently staminate, its anthers pale yellow, the basal portion pistillate, its stigmas dark umbrineus.

The Bicolanes or natives of our region call it palawan or palauan.

Epipremnopsis huegeliana (Schott) Engler

Notes for 16052: — A low climber along the lower side of small tree trunks or on stony ground in wooded ridges at 1500 feet; stem compressed, 1 inch thick, 5 to 8 feet long or high, dark or dull green, very sparingly branched, taking root along the sides of its host or support; leaves alternating, in two rows; petioles 1 to 1.5 foot long, ascending or horizontal, subterete, green, grooved along the upper basal portion; the blades descending, a trifle longer, thinly coriaceous, the segments nearly flat and paler green beneath; peduncle subterminal, also ascending and similarly green, terete, 1 foot long; head erect, 3 inches long, ochraceus, 0.75 of an inch across the middle or its widest portion.

The terminal part of the stem with the young leaves are copiously enveloped by thin and dry, brown colored shredded sheaths. In the field this species can always be recognized by the more or less circular holes of various sizes in or through the older leaf blades. These holes are sometimes more scattered along the sides of the midrib, and are evident on every one of our herbarium specimens.

Epipremnum glaucicephalum Elm. n. sp.

A tree trunk climber. Stem nearly 5 cm thick, terete or somewhat flattened along the surface of its host, dull green, few branched toward the top or 7 m above ground, crooked, occasionally ringed, the young tips of the stems or branches paler or lighter green in the fresh state and covered by shredded or marcescent sheaths; central fibers pulpy and dingy white, the sapwood portion clearer white and harder; roots mainly toward the base of the stem or near the ground, terete, 1 cm thick more or less, wiry and tightly cleaving to their hosts and extending toward the ground; stem rootlets short, arranged in linear rows or in small groups along the contact side of the stem or branches. Leaves alternate along the upper portion of the stem and branches; petioles nearly 6 dm long, deep green, rigid, deeply grooved along the entire upper length, gradually thickened or expanded toward the base, ascending, glabrous, stout, obscurely curved at the distal end; the laminae portion on my specimen slightly exceeding the length of the petiole, also glabrous, descendingly curved, heavy, tan color on both sides when dry, tough; midrib pronounced beneath, caniculate along the upper side; blades paler green beneath in the fresh state, similarly disposed, coriaceous; the average segments 25 cm long by 4 cm wide across the middle, ascendingly extended or rather forwardly curved, linear, the basal pair shorter and twice as broad, a dozen or more on each side of the midrib with the apical ones reduced, apex truncately oblique and extending into a sharply pointed ascendingly curved tip, regularly separated from each other by rounded sinuses terminating 1 cm from the midrib or more distant toward the apex; midnerve whitish beneath, solitary in each segment except on the basal pair, a trifle ascendingly curved; veins subparallel to the midnerve, numerous, evident from both surfaces. reticulations minute and obscure. Inflorescence or infruc-

tescence terminal, erect, their peduncle stout, 2 dm in length or shorter by 2 cm thick, glabrous, green, at the base enveloped by much shredded bracts or sheaths; spathe terete, subfusiform but more pointed toward the distal end, 3 to 5 cm thick across the middle, glaucous green but yellowish on the inner side, very thick, glabrate, imbricate in the early state, 2.5 dm long by 10 cm wide when spread out, apex with a 5 cm long point which at full maturity becomes reflexed before falling, curing dull leather brown; spadix sulphureus when young and enclosed by the spathe, crowded with pistillate flowers; florets 5 mm long and light brown on my specimens, the crustaceous truncate apex irregularly short oblong or sometimes circular in shape, the stigmatic portion at the bottom of the cup usually elongated, the rim rather gray than brown on my dry specimen, the angular sides densely clothed with yellowish brown glistening and very linear spicules, they with their enveloping membrane becoming detached at the base. The Bicolanes call it ambong or amblong. A number of our climbing aroids produce air roots the fibers of which are locally utilized as a foundation in the weaving of coiled baskets.*

Type specimen number 15135, discovered by *A. D. E. Elmer* in rather dry woods at 750 feet altitude along the road to Bulan, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

In the type collection there are two mounted sheets under different genus covers, the Bureau of Science number 12587 and which is named as a cotype of the unpublished *Epipremnum angustilobum Krause,* and the other specimen is my own number 5539 determined as *Raphidophora merrillii Engler.* To me these two speci-

---

* See *Theodore Muller* — Industrial Fiber Plants of the Philippines, Bureau of Education Bulletin No. 49 page 93.

mens, collected practically in the same locality, represent but one and the same species, neither one is a match to my new species here proposed.

Epipremnum miniatum Elm. n. sp.

A suffrutescent tree trunk climber. Stem or stems several, the main stem 7.5 m long or high but which is decayed toward the ground and provided with roots, 4 cm thick, crooked, subterete or somewhat compressed along the surface of the host, few branched toward the top, the erect branches as well as the stem cleaving to the host tree, marked by the leaf scars, the rootlets primarily along its contact side with the host; central tissues pulpy, white, with a disagreeable taste but otherwise odorless, the outer tissues dingy white and more ligneous; bark smooth, yellowish gray, dark green beneath the epidermis; roots arising from the basal portion of the original stem, slender, smooth, terete, crawling downward into the ground, brown, very sparingly branched, wiry and with a very stiff woody central mass. Leaves few along each of the cleaving branches, alternatingly scattered from 10 to 25 cm apart, the old stem or its older branches leafless; petioles ascending, stout, obscurely compressed, dull green, glabrous, 2 cm thick, usually enlarged at the base, nearly a meter long or shorter, grooved along the upper side especially toward the distal end, rigid; the blade portion a trifle longer, horizontal or descending; leaflets or segments smooth or glabrous, coriaceous, subpendant, slightly curved upon the upper darker green surface, heavy, numerously dissected from base to apex, the basal pinnae toward the crooked petiole more numerous and narrower, the basal one appearing falcate, a trifle shorter and narrowed or stalk like toward the base, the normal ones 35 cm long, ranging from 2 to 3 or even 5 cm wide on number 16422, distinctly linear but

the gradually tapering apex usually curved upwardly, the sharp point wearing off on my dry specimens, curing dull brown or turning blackisk on both sides; rachis also stout and smooth, pale green, deeply channelled along the upper side; midrib prominent beneath, sometimes extending through the middle of the pinnae but usually a trifle more to one side, with a pair of secondary nerves running submarginally from base into the apex, with scattered oblique veins extending from the midrib to the secondary nerves on either side, reticulations faint but evident from both surfaces. Inflorescence erect from the uppermost or lateral leaf axils, not numerous; peduncle solitary, subterete, pale green, 10 to 15 cm long or twice as long, 1.5 cm thick, subtended or enshrouded by dry lacerated bracts; spathe about 15 cm long, gradually pointed toward the apex, thick and leathery, dull green or turning brownish on the exterior, strongly imbricate, the interior totally flaveus in anthesis; spadix equal in size, 2 cm thick for both the male and female portions, 10 cm long more or less, the florets also yellow, blunt at both ends; mature fruiting head up to 25 cm long and 4 cm thick, terete but often crooked; the divisions truncate, irregularly circular or short elliptic, black when dry, the depressed central portion bearing a narrowly elongated dull brown stigma; carpels when young luteus, flat at the thickly crustaceous top, when ripe exactly miniateus; seeds plano-convex, 5 by 8 mm from the side view, obscurely nitched on one edge or side. Amblong in Bicol.

Type specimen numbers 15113, 16422 and 14522, discovered by *A. D. E. Elmer* in rich soil of light woods along stream banks from 500 to 1500 feet in altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October and November 1915 and in June 1916.

By mistake number 14522 was distributed under an unpublished name as *Epipremnum luzonense Krause.* It

is identical with number 15113 or *Epipremnum miniatum Elm.* here described. Specimen number 16422 was sent out as *Epipremnum sorsogonense Elm.* but which I now regard as the same species. These three numbers have very similar leaf characters, far more numerously pinnate and with much longer segments than those on my Lucban specimens 7623 and 9253, the type numbers for *Epipremnum philippinense E. & K.* Through some error both of these type numbers were sent out under *Epipremnum elmerianum Engler* based upon my number 7295 from Leyte and which is a very different plant.

Epipremnum multicephalum Elm. n. sp.

Climbing moderately small trees. Stem 2.5 to 4 cm thick, up to 7 m above ground, subterete and very crooked, tightly attached to its host by its side rootlets, branched at or toward the top; the branchlets more or less circling the stem of its host, green or dull gray and conspicuously roughened by the old leaf scars. Leaves alternatingly crowded toward the top of the main stem and its branches, 1 m long including the petiole; leaf stalk erect or ascending, shorter than the laminae portion, green, smooth, tan color in the dry state, compressed, deeply channelled along the upper side, somewhat expanded toward the base, curved at the distal end; blade longer, horizontal and recurved; its rachis raised beneath, caniculate along the upper side, curing dull or dark brown; segments mainly horizontal or when old descending, well separated by the sinus clear to or near to the rachis, 5 to 8 on each side, the smaller leaves with only 3 segments on each side, coriaceous, paler green beneath, on my dry specimens dull brown on both sides, 12 to 18 cm long, 6 to 8 cm wide, the basal and the apical ones triangular in shape and with acuminate apices, the middle or normal segments nearly rectangular except the suboblique truncate distal end which is terminated by an upturned rather short and acute point,

the lower or opposite corner is rounded; the greenish white principal nerves of the segments vary from 3 to 5 or 6 according to the size or width of the broad pinnules, straight from the rachis to the truncate apex where their tips are ascendingly curved; the parallel veins numerous, faint yet more evident from the lower side, the crossbars or reticulations obscure. Infructescence terminal, erect, severally clustered; peduncles excrescent toward the distal end, averaging 15 cm in length, subcompressed, ascending, dark green and glabrous, at the base enshrouded by thin lacerated blackish brown sheaths; spathes very thick, greenish on the outside, imbricately twisted and acuminately pointed at the apex, as long or a little shorter than their stalks, bluntly rounded at the base, yellowish white on the interior and tightly enclosing the sulphureus cob, dark leather color on my dry specimen; flowers forming a solid spadix about as long as the spathe, yellowish but in the dry state gray, the truncate top angular and sunken in the center, the crusted rim light gray and appearing fuzzy, the stigmas brown in color; the perianth thin, the crustaceous cap extending half way down and enclosing the stamens with blunt elongated anthers, finally separating toward the base into numerous hyaline setae; pistillate florets or the fruiting spadix 18 cm long by 2 cm thick, terete, becoming well separated when mature or upon drying, 7.5 mm in length, the upper crustaceous and angular portion extending half way to the bottom, the basal portion of the perianth subhyaline and containing the seeds; seeds many, 1.5 mm long, compressed elliptic, the linear central portion lighter brown in color, attached to filamentous strands from the base.

Type specimen number 16061, discovered by *A. D. E. Elmer* in wet densely humid depressions at 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May 1916.

It is most unlikely *Epipremnum pinnatum (Linn.) Engler*, nor does our specimen match the type of *Epipremnum robinsonii Krause* which should be considered a distinct species.

Epipremnum truncatum E. & K.

Notes for 14721: — Climbing along small tree stems of a humid rich forested flat at 750 feet; stem tightly attached, curved and twisted, compressed, one half to three quarters of an inch thick, 5 to 9 feet long or high, seldom or very short rebranched from the top; leaves heavy, horizontally spreading, slightly paler beneath; petioles also green, subterete and grooved along the upper side especially toward the base, alternatingly crowded, the 5 to 8 inches long and ascending peduncles similar; fruits heavy, divaricate, one and one fourth of an inch in diameter, almost equalling their stalks in length, terete, avellaneus brown.

Homalomena philippinensis Engler

Notes for 14996: — Rank succulent herbs in wet black humus covered soil of thickets and woods in a small flat at 1000 feet; old stem 2 inches thick, terete, crooked, occasionally branched, creeping or decumbent, the leaf bearing portions ascendingly curved; leaves several in a cluster, erect or ascending; their petioles dark green, subterete, herbaceous, a few feet to a yard long, grooved along the upper side toward the much expanded and imbricated bases; blades horizontal, somewhat paler green beneath, coriaceous; fruits in small cluster enclosed by marcescent sheaths at the base, usually few clustered from the leaf axils; peduncle green but yellowish tinged toward the base, subterete, 4 to 8 inches long, strongly recurved from the base, ultimately a trifle ascendingly curved, bearing the green outwardly pointed and fusiform 2 inches long terete

heads which are sharply pointed. The base of the petioles when pulled off has a very sweet chewing-gum odor especially when the tissues are crushed.

Pistia stratiotes Linn.

Notes for 14358: — Floating masses in clear shallow nearly stagnant water, or gregarious masses rooted in small mud flats and in carabao wallowing holes of the Irosin valley at 250 feet altitude; plants solitary or few connected by a fleshy rootstock; roots blackish, profuse and feathery; leaves forming rosettes, the inner ones much folded, pale green or yellowish green toward the cushion like base, the ridged veins beneath frequently reddish tinged; flowers greenish to white, in pairs, in the upper or inner leaf axils, in case the parent plant is still connected with one or more real small or young ones, they too bear flowers; fruits recurved from the lower or older leaf axils, subtransparent, containing several green seeds. The natives or Bicolanes call it dara-ero. In Manila it is known as kiapo, and can be seen as floating masses on the Pasig river, besides growing in mud flats.

Pothoidium lobbianum Schott

Notes for 14429: — Climbing about large tree trunks up to 30 to 40 feet high in woods of the hemp regions at 250 feet altitude; stem terete or round, one half of an inch thick or thinner, dark green, occasionally branched, the branches long and drooping; leaves also pendant or drooping, similarly green on both sides, the segmented tips more deflexed, coriaceous, flat or curved upon the nether side; infructescence erect, green or the stalks occasionally purplish brown; fruits ellipsoid, green when young, when older yellowish to red, finally deep red and shining. Maraypan is the name given to it by the Bicolanes.

Pothos rumphii Schott

Notes for 15854: — Medium sized tree climber in very damp wooded depressions at 1750 feet; stem rigid, dark green, occasionally branched, climbing up to 30 feet above the stony ground, subcompressed, one half of an inch thick, with numerous rootlets which tightly attach it to its host or support; leaves alternatingly crowded all along the upper portions of the main stem and branches; petioles ascending, also compressed but not very rigid, deeply folded on their ventral sides; blade usually descending, coriaceous, lucid above, paler beneath; spike upon ascending and subterete stalks or peduncles, recurved, subtended by a grass green linear somewhat twisted bract; flowers greenish.

This number was provisionally distributed as *Pothos clemensii Elm.* a new species. In looking over the entire collection in the Bureau of Science, both Philippine and foreign, there exists a great variation in our local materials named *Pothos rumphii Schott.* A specimen from Palawan has spathes with spadix 3 to 5 cm long, and in other specimens from our islands the fruiting spadix measures over 2 dm in length. My specimen in hand is exactly the same as 685 *Clemens* from Mindanao, both of our leaves are distinctly oblong and with narrowed bases, not elliptic and with subauriculately rounded bases as in *Robinson's* numbers 116 and 117 from Amboina. The latter number from Amboina bears far larger drupes than on any of our mature Philippine socalled *Pothos rumphii Schott.*

Pothos ovatifolius Engler

Notes for 15204 not given.

Pothos peninsularis Elm. n. sp.

A climbing vine or scandent shrub. The twig of the stem is terete, slender, 3 mm thick, 3.5 dm long on my

specimens, tough or wiry, flexible, glabrous, green but dark tan when dry, finely ridged longitudinally, the older parts transversely marked by leaf scars. Leaves copious, subpersistent, curing a light copper brown on both surfaces but especially on the under side, entire, elliptic but unequally divided by the midrib, apex obtuse but usually obtusely rounded and terminated by an abrupt twisting and setaceous point 1 to 1.5 cm in length, the base broadly obtuse to obtusely rounded and minutely auriculate, alternate, equally scattered along the ultimate branchlets, ascending, flat, my longer blades are 10 cm long by nearly 5 cm wide across the middle or widest portion, the smaller ones 6 cm long by one half as wide in the middle, subchartaceous; midrib also glabrous, smooth, prominently ridged beneath, plane above, straight from the base to the apex where it curves into the sidewise or twisting point, black at the base where it contacts with the petiole, otherwise light brown, dividing the blades into slightly unequal halves; secondary nerves faint, few and paralleling each margin more or less; veins numerous, extending from the midrib and contacting with the secondary nerves, all equally visible from both sides, even the fine reticulations similarly evident; petioles suberect, strict, rather stout with the winged upper side which terminates 6 mm below the distal end and which forms a trough along the upper side of the leaf stalk, a trifle clasping at the base, tan color on my specimen, 3 dm in length, alternate and regular in distribution. Old infructescence arising from the uppermost leaf axils, slender, our peduncles 5 to 7 cm long and erect; the spadix shorter, also slender, terete, 4 mm thick more or less; spathe not seen, neither the flowers nor the fruits.

Type specimen number 17050, discovered by *A. D. E. Elmer* at Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

This plant may be *Pothos inaequilaterus (Presl) Engler*, but certainly not the first number cited in the original description of *Pothos philippinensis Engler*.

Raphidophora bulusanensis Elm. n. sp.

A rank climber. Stem coarse, 5 cm thick. Leaves few, scattered or more crowded from the ends of the stem and branches, alternate; petioles ascending, glabrous, succulent, from 3 to 7 dm long or even longer the lateral wings along the upper sides forming a deep groove and gradually dilated toward the clasping base, yellowish brown when pressed; blade also glabrous and succulent, entire, not lobed nor pinnatifid, margins wrinkled in the dry condition, similarly yellowish brown on both surfaces in the dry state, ovate in shape rather than elliptic, 28 cm wide a trifle below the middle and 4 dm in length on my specimen but often larger, base broadly rounded and shallowly cordate, above the middle gradually tapering to an acute apex, heavy or thickly coriaceous, totally glabrous on both sides, mainly horizontally disposed; midrib very stout beneath, plane or narrowly grooved on the upper surface toward the base, likewise smooth and glabrous, light yellowish brown on the herbarium specimen, straight from the base clear into the apex; secondary nerves comparatively fine, usually a pair running close together submarginally from bottom to top; veins very numerous, subdivaricate, parallel, occasionally a stronger one interspersed, from midrib to the ascendingly curved ends where they run together into the first secondary nerve below the edge of the blade, minutely ridged on both sides of the dry laminae, reticulations or cross bars none or very obscure. Infructescence apparently terminal and arising from the leaf axils, erect or nearly so; peduncle stout, 3 to 5 dm long or longer, curing light tan as the leaf portions; spathe linear, 3 dm long more or less, leathery, yellowish green yet seemingly tinged with purple on the smooth inside surface, the exterior longi-

tudinally veined, imbricate or well enveloping the cob, thickest across the middle region but more tapering toward the rather sharp apical point; cob or spadix greenish in the young state, turning yellowish when old, about as long as the spathe; cap of florets angular to rectangular, crustaceous, dark brown or nearly black, truncate but the minute and brown colored stigma upon a slight elevation; the fruiting spike terete, 3 cm in diameter on the dry specimens, filled with seeds; seeds arranged in tiers or in a few rotate clusters one upon another, achene like, light brown, 2 mm long, ellipsoid but with their inner edge linearly flattened.

Type specimen number 16790, discovered by *A. D. E. Elmer* at 2000 feet altitude of the mountain, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July 1916.

Heretofore this plant has been referred to *Raphidophora monticola Krause* based upon my collection from Negros. Our new species is a much larger plant, and there are good differential characters in the leaves. Besides Sorsogon province it is also known from the summit region of mount Maquiling.

Raphidophora elmeri E. & K.

Notes for 15116: — Climbing along trunks of trees of steep wooded ravine slopes at 750 feet; stem at least 1 inch thick, subterete, occasionally branched toward the top or 20 feet above the rocky ground in which it was growing, green or yellowish brown, ringed, crooked, tightly cleaving to the host by short rootlets; central portion of the stem dingy white and pulpy, slightly sweet, the sapwood region whiter and with a clear somewhat viscid juice; bark on the twigs deep green, on the older stem only the hypodermis deep green; petioles alternatingly along or toward the end of the stem and branches, green, ascending, deeply grooved along the upper side; blades thickly coria-

ceous, horizontal or descending, much lighter green beneath; peduncle subterete, yellowish green, 3 to 5 inches long; spike terminal, erect, cylindric, flaveus, tightly enveloped by a thick and greenish spathe which also turns yellow when in full anthesis and which is terminated by a 2 inches long point; spadix glaucous green when immature, 1 inch thick, 3 inches long, terete, likewise erect.

Raphidophora rigida E. & K.

Notes for 15056: — Upon the larger limbs of trees in very humid and densely wooded ravines at 2750 feet; stem 1.5 of an inch thick and terete, very dull green, crooked, occasionally branched and forming a coarsely tangled mass; tissues of the greater central mass suffrutescent, greenish white, odorless, a trifle sweet, the outer one third whiter in color and with a clear viscid juice; branchlets ascending or erect, one half as thick as the main stem; leaves alternatingly crowded, heavy and thickly coriaceous, shallowly folded, the short tip strongly recurved, much paler beneath, diverse in size, ascending or horizontal; petiole pale green, fluted along the upper side, only slightly expanded at the base, leaving a ring like scar after falling; peduncle yellowish green, terete, one half of an inch thick, terminal, ascending, 6 to 10 inches in length; spikes with the close fitting herbaceous and leathery sheath somewhat shorter but strictly erect, of the same color, rather pointed, the spathe finally falls or rots off, leaving the pale yellow fruiting spadix exposed.

Schismatoglottis irosinensis Elm. n. sp.

Small terrestrial plants with suberect corm less than 1 cm thick, bearing slender herbaceous roots. Leaves few to several in a tuftlet, erect from the base, up to 3 dm in length including the petioles, glabrous, horizontally spreading over the ground or more ascending, submembranous,

in the dry state very thin and unequally olivaceus on the two surfaces, much paler or lighter beneath in both the fresh and dry leaves, the upper side described as mottled with dark green marginal region and the whitish middle zone, entire, flat, cordately elongated or oblong, the blades 12 to 20 cm long by 3.5 to 5 cm wide below the middle, equally sided, the base deeply cordate, its lobes rounded, the upper half gradually tapering into the sharply or slenderly acuminate apex which on my specimens are a trifle curved to one side; petiole very slender, glabrous and curing dull brown, 9 to 13 cm long or longer, the basal 3 to 5 cm decurrently winged with a thin light brown membrane along the upper side, alternatingly crowded and clasping; midrib more pronounced beneath, curing brown, plane or flat on the upper surface, glabrate, straight or a trifle curved toward the distal end, dividing the laminae into nearly equal halves; nerves 6 to 9 primary ones from each side of the midrib, rather faint but quite conspicuous from the lower side, brown when dry, ascending curved, frequently with secondary ones in between; veins very faint, parallel with the nerves, only evident from the nether surface. Inflorescence erect from the leaf axils, also glabrous, dirty brown when dry; peduncles very slender, up to 10 cm long, gracefully recurved and gradually expanding toward the flowers or fruits; flowering heads terete, 3 cm in length, entirely glabrous, fusiformly lanceolate but with a constriction below the middle; spathe membranous, of a rich brown on my specimen, subterete and imbricately folded, fusiform in shape, gradually tapering into the acuminate point or apex, longitudinally veined. apparently calyptrate, leaving a blunt and ruptured top of the lower or pistillate portion which ultimately retains the seeds; perianth of fruiting receptacles very thin and hyaline, the persistent stigma minute and brownish; seeds

about 5 to each floret coming to maturity, ellipsoid, 1 mm long, chalky white, with prominent ridges or wings from end to end, the edges of these wing like ridges are minutely tuberculate but of the same color.

Type specimen number 14594, discovered by *A. D. E. Elmer* in loose ground of densely wooded north ravine slopes at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

The specific name under which my specimens were sent out is already used, therefore the new name *Schismatoglottis irosinensis Elm.* The above diagnosis does not include a stray specimen with tan colored leaves which are much narrower and have small truncately rounded bases.

Schismatoglottis latifolia Miq.

Notes for 14739: — Upon ledges of a deeply shaded stream bank at 1000 feet; stem or rhizome at least one half of an inch thick, terete, crooked, winged, only few and short rebranched; leaves few to severally clustered, the pale green petiole provided toward the base with a decurrent stipule forming a channel along the upper side, entirely odorless even when crushed; blades coriaceous, descending, whitish green beneath; peduncles also whitish green, round or terete, in the fruiting state recurved; the cremeus male portion erect and terminal while the female lower portion is clothed with the greenish colored spathe.

In Pflanzenreich part 55, page 88 there is described *Schismatoglottis luzonensis Engler* based upon Bureau of Science number 5047. Then on page 121 of the same publication the same author again describes *Schismatoglottis luzonensis* founded upon Bureau of Forestry number 1243. These specimens represent two very distinct plant species. Our number was distributed as *Schismatoglottis luzonensis Engler*, but which may be the variety of the plant under which it is here listed.

Scindapsus curranii E. & K.

Notes for 14590 and 16556: — Scandent along small tree stems in wet sand gravelly soil of very humid forested flats and along streams at 750 feet; stem or stems bendable, less than one half of an inch thick, subterete, dark or dull green, from 10 to 15 feet high, ringed every 3 to 5 inches, taking rootlets at the joints, more or less crooked, occasionally branched along the main stem but profusely branched toward the top; the ultimate branches long, curved and drooping, becoming interlaced, at first descending, finally ascendingly curved toward their tips, as thick as a man's small finger, of the same green color as the stems; woody fibers tough and yellowish, the whitish pith relatively large; blades pendant from ascending involutely twisted green herbaceous stalks or petioles, flat and paler green on the nether side; inflorescence erect, 3 inches long, one half to three quarters of an inch thick, fusiform, glaucous black, in the early state clothed with a smooth shining green sheath or spathe which with maturity turns creamy yellow or creamy white on the inside; spadix or cob quite thick and rigid, terminated in a green, slender and curved point; florets sulphureus except the green margins between the individuals; fruiting spike erect, terete, very dark or a sort of metallic green or dull atro-viridis.

Scindapsus hederaceus Schott

Notes for 15230 not given.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. X Manila, P. I., May 28, 1938 Art. 134

IROSIN SCHEFFLERA

by

A. D. E. ELMER

—x—

Schefflera bulusanensis Elm. n. sp.

A scandent and rebranched shrub. Twigs crooked, terete, relatively lax in the fresh state, 5 mm thick or thinner, entirely glabrous, striately wrinkled on the dry specimen, annularly marked by the old leaf scars. Leaves alternate, widely scattered along young twigs or shoots, usually closer set toward the ends of the branchlets, greatly varying in size, ascending or horizontal; petiole 5 to 7 cm long or only 3 cm in length, slender, strict, glabrate, pale green but dirty brown when dry, longitudinally striate or finely fluted, subterete, expanded at the base, leaving conspicuous scars after falling; interaxillary stipules broad, also glabrous, coriaceous except the thin brown colored margin, subpersistent or falling with the petioles; leaflets 3 to 7 or rather 3 to 6 only, very unequal in size, the smallest ones bract like, horizontally and rotately spreading, coriaceous, entire, flat, paler beneath, curing dull or dark brown on both surfaces, glabrous, up to 8 cm long including their petioles, less than 3 cm wide across the

MISSO[URI BO]TANICAL RECEIVED JUL 6 1938

middle, broadly lanceolate to oblong with sharply acuminate tips and acute to obtuse bases, often a trifle inequilateral and then with distinctly falcate apices; petioles exceedingly variable in length, from 5 mm to 2.5 cm long, radially spreading, rounded or minutely caniculate along the upper side, ground color on my specimens, proportionately slender; midrib stout, raised beneath, plane above, smooth and glabrous; veins 3 to 5 pairs, much ascending, equally evident from both sides, the reticulations relatively coarse and obscure. Inflorescence terminal, from 1 to 3-spicate, erect or ascending, glabrous, blackish brown when dry; spikes 5 to 8 cm long, flower bearing from below the middle, unbranched, usually curved or somewhat sinuose; peduncles one third the length of the spike, terete and quite stout as is also the rachis, at the base subtended by a solitary bract which is glabrous, thick in texture, 5 mm long and ovately acuminate or scoop like in shape; flowers irregularly scattered in small glomerules which are subtended by comparatively large subpersistent bracts; pedicels glabrate or nearly so, spreading, single, thick, 5 mm long in anthesis; flowering head flatly globose; the four broadly oblong petals striate and well closing over the stamens, becoming detached at the rugulose circular disc like calyx base which is glaucous at the flat top; stamens 4, introrse, the filaments at most 1.25 mm long, the elliptic to oblong anther one half as long and notched at both ends or nearly free and versatile; stigma sessile.

Type specimen number 17130, discovered by *A. D. E. Elmer* in alpine woods at 3500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

The cut or shape of our leaflets is very similar to a number of our high mountain species. Our inflorescence is quite distinct from *Schefflera chartacea Merr.* which is identical to *Schefflera luzonensis Merr.*, but our spe-

cies is most critically related to *Schefflera caudatifolia Merr.* and to *Schefflera urdanetensis Elm.*

Schefflera catanduanensis Merr.

Notes for 14745: — Strangling epiphytes upon large trees in humid forests at 1000 feet or higher altitude; stems few to several from the same base, the larger ones as thick as a man's body, 10 to 25 feet long, only occasionally branched, ascending or horizontally spreading; wood very soft, fibrous, white; bark grayish mottled, nearly smooth, thick, also white except the epidermis; twigs long, about 2 inches thick, terete, ascendingly curved; leaves alternatingly clustered toward the end of the branchlets; the petiole green and rigid, ascending, 1 yard long for the larger ones, thickened at the base and with a thick acute interaxillary stipule which are very excrescent; blades horizontally spreading, rigid, heavy, conduplicate upon the upper deeper green side; inflorescence erect or suberect, 1 to 2 feet long, paniculately branched, the ascending branches unbranched, the stalks purplish brown, bearing floral heads from below the middle; heads alternate, 5 to 8 on each branch, upon short thick stalks, globose, 1.5 of an inch in diameter, snow white; stamens and pistils yellowish green, the anthers when old brownish. Upon the falling of the corolla caps there is a sweet clear liquid saturating the whole head in a watery mass which if not used or absorbed by insects accumulates and drops off. Swarms of bees and other *Hymenopterous* insects were busy around these sweet and liquid soaked heads.

My specimen is much larger than *Merrill's* type sheet and possibly merits specific rank. For this reason it was sent out under a provisional new name as *Schefflera mellifera Elm.* It is here listed under the genus *Schefflera*, although it should have been originally distributed as a species of *Cephaloschefflera*.

Schefflera cumingii (Seem.) Harms

Notes for 14437: — Epiphytic upon an old tree trunk 6 feet above the humid hemp ground at 250 feet elevation; stems very numerous, terete, 3 to 7 feet long, 0.5 of an inch thick, occasionally branched; wood soft, greenish, odorous; bark green to gray, smooth or lenticelled; leaves horizontal or descending, tips strongly recurved, rigidly coriaceous, much paler beneath; inflorescence similarly spreading, flowers greenish except the yellowish stamens; fruit yellow or orange red when mature.

Among a half a dozen related species in the Philippines, it is nearest or almost identical to the above specific name. It was sent out as *Schefflera multicaulis Elm.* a new species.

Schefflera elliptifoliola Merr.

Notes for 14457 and 14815: — Subscandent or epiphytic upon a medium sized tree trunk in fertile soil of the Manila hemp fields at 250 and 1000 feet altitude; stems severally clustered from the same root base, few inches thick, 10 feet long, terete, crooked, rebranched from near the base; twigs ascendingly curved, branchlets 0.5 of an inch thick; wood greenish, odorous, soft; bark smooth, brown or yellowish to gray; petioles ascending, the leaflets horizontal and rotately spreading, coriaceous, usually folded or conduplicate upon the upper somewhat darker green surface; infructescence erect or ascending, stalks flexible and yellowish green, the exposed stalks as well as the buds purplish brown; ovary and filaments yellowish green, anthers purple; immature fruits subglobose and yellow, maturing more red than yellow.

Bicolanes call it carankang. Both of my numbers were at first thought to be distinct, and so were distributed un-

der a provisional new name as *Schefflera auranticarpa Elm.*

Schefflera insularum (Seem.) Harms

Notes for 14466 and 14857: — Subscandent along the nether side of a large tree trunk and becoming epiphytic, in woods with thickets or on a steep humid ravine at 1250 feet or at lower altitudes; stems few from the same cluster, terete, few to several inches thick, 10 to 15 feet long; twigs 1 inch thick, divaricate from the main branch toward their distal ends, ascendingly curved, the slenderer ones only 0.5 of an inch thick; wood soft, greenish white, odorous; bark brown, when old roughened with excrescences; leaves alternatingly crowded toward the ends of the branchlets, upon green, ascending and terete stalks; leaflets coriaceous, horizontal or rotately spreading, shallowly folded upon the upper slightly greener side, upon ascending petioles; inflorescence lateral, sometimes terminal, 6 to 10 inches beneath the foliage, with 3 to 5 or even 7 stalks, the peduncles with the rachis bendable and from 6 to 16 inches in length, all radially spreading; calyx portion dark green, stamens and pistils creamy white; the cremeus flowers are faintly fragrant.

Number 14857 was sent out as *Schefflera decidua Elm.*, but it appears to be only a form of the above named species.

Schefflera longifructescence Elm.

Notes for 16274: — A coarse tree climber in damp rocky ground of a wooded ravine at 1000 feet; stem 1.5 of an inch thick, terete, inclined to twine, occasionally branched but especially so at the top or 20 feet above the ground; wood white, soft yet rigid and brittle, with a large pith; the smooth bark gray but hypodermis dark green; main branches few, long and drooping toward their ends, sparingly rebranched; leaves alternatingly scattered, the

dark green divaricate petioles enlarged at both ends; the leaflets ascending from the petiolules, nearly flat with recurved tips, dark green above, glaucous beneath, heavily coriaceous; infructescence drooping, with few long spikes, terminal, rachis atropurpureus, the ripe fruits bluntly ellipsoid, aurantiaceus.

This plant was also wrongly determined as *Schefflera longispicata Elm.* a new name.

Schefflera pentaphylla Elm. n. sp.

A rambling or subscandent shrub. Stems several from the base, widely spreading, somewhat drooping, 1 to 2 m long, crooked, 1 to 2.5 cm thick, moderately rigid, terete, branched; woody tissue greenish, strongly odorous, covered by a smooth greenish gray bark; ultimate branches or twigs glabrous, grayish brown when dry, the finer ones 5 mm thick, obscurely wrinkled and forming longitudinal ridges. Leaves horizontal, radially spreading, thickly coriaceous, alternatingly scattered, pentamerous, darker green above and grayish green or glaucous beneath, nearly flat but with strongly recurved tips; petioles stout, ascending, strict, subterete, smooth and glabrous, curing dirt brown, varying from 3 to 8 cm in length, expanded at the base and attached to the blunt and leathery interaxillary stipule; petiolules likewise variable in length, upwardly curved at their distal ends, from 1 to 5 cm long, stout to slender, caniculate along the upper side, similar in color; leaflets equally dull brown on both sides, entire, abruptly tapering to the sharply acuminate or setaceous apex which is occasionally turned a trifle to one side, base varying between subcuneate to obtuse; the larger ones oblongish, sometimes broadly lanceolate, the smaller ones subelliptic, coriaceous, often a little inequilateral, the blades up to 12 cm long and one third as wide across the middle or just above it; midrib prominent beneath, plane or scarcely de-

pressed on the upper surface; lateral nerves from 3 to 8 on each side according to the size of the blade, conspicuous beneath, strictly ascending, the lower pair arising from the base, tips interarching, reticulations coarse and relatively conspicuous from both sides but especially from below. Infructescence terminal, the few spikes radially spreading, ascending in anthesis, glabrous or puberulent; the fruiting spikes becoming recurved, 15 to 35 cm long, slender, most of this length is fruit bearing; peduncle glabrate, about one third to one half the length of the spike, slender in the flowering state, each subtended at the base by an ovately oblong and sharply acuminate glabrous 1.25 cm long bract; rachis at first puberulent and dark purple, finally glabrate and straw brown, longitudinally striate; fruits promiscuously scattered in small glomerules; pedicels also purple when young, strict, at right angles to the rachis, slender, free or arising from a club shaped base, puberulent, 3 to 5 or more mm in length; calyx portion turbinate, hooded over by the corolla, calyx rim undulate, top rounded and glaucous, stigma sessile; stamens 4 to 5, free, introrse, well covered by the adnate petals which become detached as a whole; filaments 1.5 mm in length; anthers short, basifixed; drupes pale yellow or aurantiaceus, subglobose, 5 mm long, nearly as broad, in the dry state angular, truncately rounded at the base, the grayish flat cone terminated by the circular sessile stigmas.

Type specimen numbers 14722 and 14596, the former discovered by *A. D. E. Elmer* in a very humid forested flat at 750 feet, the latter number upon a small tree trunk near wooded cliffs at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

Unquestionably it is nearest related to *Schefflera trifoliata M. & R.* which should be reduced to *Schefflera piperoidea Elm.* Our leaves are pentamerous rather than

trimerous. The small piece of fruit in our packet for number 14596 may or may not belong here.

Schefflera populnea Elm. n. sp.

A part parasitic shrub or wholly epiphytic in habit. Stem several, 1 to 2 m long or longer, descendingly spreading, sparingly rebranched, terete, 3 to 5 cm thick at the base; wood sappy white, soft, with fine radial rows, of a carrot odor; bark smooth, yellowish gray, thick, the inner portion greenish and with a clear viscid juice; twigs coarse, on my dry specimen 1 to 1.5 cm thick, rounded, glabrous, yellowish brown when dry, lenticelled. Leaves alternate, not numerous, coriaceous, horizontal; petioles very stout, 10 cm long or on some only half as long, terete along the upper side, much thickened toward the base which is solidly attached to the very thick interaxillary stipule, glabrous, yellowish brown when dry especially the wrinkled basal portion, usually ascending; stipules on my specimens 3 cm long, acuminately tapering from the base, erect, exceedingly thick or fleshy, glabrous, the marginal line relatively thin and brown or tan in color, strongly involute toward the apex, persistent; petiolules varying from 3 to 8 cm in length, glabrous, curing yellowish, comparatively slender, thickened toward both ends, subterete but caniculate along the upper side especially toward their ends, longitudinally striate or minutely ridged, the thickened ends transversely wrinkled; leaflets usually 5, horizontally spreading, coriaceous, darker green above, flat but the acute to sharply acuminate tips recurved, entire yet occasionally coarsely undulate or obscurely lobulate toward the base, cordate to triangularly ovate or even elliptic, seldom inequilateral, the base is sometimes broadly truncate to broadly obtuse, and again shallowly cordate to unequally cordate, either gradually tapering from below the middle toward the apex or more rounded toward the top, most of my triangularly formed and largest sized blades are

12 cm long by 8 cm wide below the middle, similarly dull copper brown on both side when dry, our smallest leaflet measures 4 by 4 cm; midrib keeled on both sides but more so beneath; lateral nerves 7 to 12 on each side, faint from both sides, reticulations obscure. Inflorescence paniculate, erect, strict, terminal, the main stalks greenish in the fresh specimens, also brownish in the dry state, glabrous, 3 dm long by one half as wide, branched from the middle, the peduncle very thick, subtended by large fleshy bracts; the main spreading branches rebranched toward their distal ends, all branches ebracteolate, almost totally glabrous, blackish brown when dry except the tan colored ovoid unopened flowers which are ultimately crowded in small glomerules; pedicels divaricate, 3 to 5 mm long; buds ovoid, yellow but turning brown; calyx portion cupular, subglaucous especially the flat conical top bearing the stigmas; corolla flaveus, cone like, easily becoming detached from the calyx rim, 3 mm long; stamens 6, pale yellow, free; filaments very short and much thickened at the base; anthers a trifle over 2 mm long, versatile, ovately oblong, bilobed below, bifid above. Dry fruits 5 to 7 mm long, ovoid, tan color, usually 6-sulcate or composed normally of 6 compressed achenes or seeds.

Type specimen number 15760, discovered by *A. D. E. Elmer* in the upper branches of large trees of secondary forests at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916.

Our specimen is different from typical *Schefflera obliqua Merr.*, but it is a good general match to the other specimens which were since collected in Surigao, Camarines, Rizal and Tayabas provinces. — In this small group of plants from Irosin there are two species originally collected in the Lake Lanao region of central Mindanao, namely, *Schefflera simplicifolia Merr.* and *Schefflera obliqua* of the same author, and which seem constantly to differ with

other similar specimens from other regions. I cannot let my numbers 15099 and 15760 pass as identical with type material of the above named species when critically comparing them side by side. Ever once in a while I find Lake Lanao plants as being quite a little distinctive when compared with related plants from adjoining floras.

Schefflera sorsogonensis Elm. n. sp.

In the crotches of large limbs of a big *Dipterocarpaceae*. Stems several, ascending, horizontal or when old descending, 1 to 2.5 m long, terete but crooked, smooth except the ring like markings of the leaf scars, in the fresh state yellowish gray, only occasionally branched; the pale white woody tissues odorous, the large pith also white; the inner portion of the bark green and with a clear viscid and strongly odorous sap or juice; ends of branchlets or twigs ascending, terete, 5 to 8 mm thick in the dry dirty brown or yellowish brown colored specimens, glabrous, when cured with longitudinal striate folds, regularly marked by the ring like leaf scars which are 2 cm apart or only half as much toward the end. Leaves simple, alternate or nearly so, leathery or thickly coriaceous, ascending or horizontal, curing black or blackish brown, when fresh shining and deeper green on the upper more or less conduplicate side, duller below, entire and wholly glabrous, its sides very sparingly and obscurely undulate and occasionally minutely dentate, subelliptic or ovately so to oblong, in the smallest ones broadly lanceolate, gradually tapering to the blunt or acutely pointed apex, base obtuse to obtusely rounded, not truncately rounded, our largest laminae 10 cm long including the petioles, 4 cm wide across the middle or below it, the smallest ones 1.5 cm by 4 cm, frequently a trifle inequilateral, margins minutely involute; midrib occasionally a trifle curved and apical portion of the blade slightly turned to one side, keeled beneath, plane on the upper surface except toward the thick base;

nerves 5 to 9 or even 12 on our larger laminae and counting the intermediary ones, more evident on the upper sublucid surface, ascending and submarginally united, reticulations not evident from below; petioles 7 to 10 mm long or sometimes longer, deeply caniculate along the upper side, at the base expanded and connected with the broad axillary stipule, often with a constriction toward the distal end and from which point the blades naturally becomes detached, the leaf however can remain until it falls with the stipule intact, thereby leaving the ring like scars; bud bracts not seen. Infructescence erect and terminal, glabrous, all the pale green slender stalks straight, blackish brown when dry; peduncles several, ascending or more spreading, 5 to 10 cm in length or longer, umbellately rebranched toward the top or from above the middle, the 2 to 3 cm long secondary peduncles more slender and radially spreading; pedicels similarly disposed, strict, at most 1 cm in length. Young fruits 3 by 4 mm, short ellipsoid, pale yellow especially the lower cupular portion, about 6-carinate; the flat conical apex glaucous green, terminated by the sessile stigmas.

Type specimen numbers 15099 and 16798, discovered by *A. D. E. Elmer* in fertile ground near a wooded stream bank at 1500 feet elevation, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915 and July 1916 respectively.

Number 15099 was distributed as *Schefflera luzonensis Elm.*, an error on my part. Herewith I propose the name of the province as its substitute. Number 16798 was sent out as *Schefflera simplicifolia Merr.* It is not at all typical, yet I have cited it above as belonging to mine rather than to *Merrill's* species. — Soon after *Mrs. Clemens* first collected a *Schefflera* species in the Lake Lanao district of Mindanao and which was published as *Schefflera simplicifolia Merr.*, a number of other simple leafed specimens

were being collected in other regions of our islands. Practically none of those more recent collections can be matched with the type specimen. The leaves of our new segregate here proposed are exactly like those of *Merrill* 8073 from Zamboanga district and *Whitford* 815 from Tayabas province.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, M. A.

Vol. X Manila, P. I., May 15, 1939 Art. 135

IROSIN MELASTOMATACEAE

by

A. D. E. ELMER

——x——

Astrocalyx calycina (Vid.) Merr.

Field-note for 16233, also see numbers 14509 and 16218: — A rather small sized tree in humid woods near a mud lagoon at 750 feet; stem 1.5 feet thick, subterete, 30 feet high, branched from below the middle, somewhat crooked; wood sappy white, soft, odorless, slightly bitter; bark yellowish gray, smooth; main branches rather long and divaricately spreading, crookedly rebranched; twigs ascendingly curved; the horizontal coriaceous leaves paler green beneath and with recurved tips; inflorescence erect, the stalks and outer calyx portion green, the inner persistent calyx portion with a flat ovary pale sulphureus; caducous petals whitish, reflexed; filaments and style similar in color; anthers and stigmatic portion pink, the stamens also deciduous but usually after the petals have fallen.

Astronia avellanea Elm. n. sp.

A small suberect tree. Stem 2 dm thick, subterete, crooked, 7 m high and branched from the middle; wood

MISSOURI BOTANICAL
RECEIVED
JUN 28 1939
GARDEN LIBRARY.

fairly hard, avellaneus toward the center; bark longitudinally checked, yellowish brown, isabellinus except the surface, the young bark on the branchlets smooth and grayish white; main branches ascending, numerously rebranched into lax and horizontally spreading ultimate ones; twigs terete or nearly so, glabrous, 3 mm thick. Leaves opposite, subcoriaceous, mainly ascending, flat except the recurved tips, subglaucous green beneath in the fresh state and avellaneus when dry, many, greatly varying in size, broadly lanceolate to oblong lanceolate, gradually and slenderly tapering toward the sharply acuminate apex which in most leaves is slightly curved to one side, base narrowly cuneate, margins entire, glabrous on both sides, upper surface turning from the dark green to a blackish brown when dry, the larger blades 13 cm long by 3 to 4 cm wide across the middle, most of them are smaller, the smallest measure only 4 cm long by 1.5 cm wide without the petiole and are distinctly lanceolate in shape. The green young twigs turning nearly black when dry, fluted or grooved along the sides, smooth and glabrous; petiole 1 cm long or shorter, glabrate, caniculate along the upper side, also turning black while curing; nerves 3, from base to apex, prominent beneath and dark brown, scarcely evident from the upper surface; cross bars faint, smooth and glabrous as are the main nerves. Panicle terminal, erect, 1 dm long more or less, laxly rebranched from below the middle, all the slender branches minutely grooved along the compressed sides, nearly black on my specimen, only the young portions very slightly sprinkled with minute scales which seem to disappear early; flowers numerously clustered toward the distal ends of the ultimate branches, usually upon very short but slender pedicels which are more or less subtended by small brown colored persistent bracts; buds subglobose, pale green, furfuraceous or ultimately glabrate; petals minute, at first greenish in color but soon turning brown; stamens deep yellow.

Type specimen number 16108, discovered by *A. D. E. Elmer* in moist stony ground along a wooded ridge at 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May 1916.

Related to *Astronia bicolor* and *Astronia discolor* of *Merrill* and *Astronia maquilingensis Elm.*

Astronia badia Merr.

Field-note for 16382:—Small suberect trees in deep gulches or in wet forested flats at 2000 feet; stem 6 inches thick, 20 feet high, crooked, subterete, mainly branched toward the top or above the middle; wood very soft, sappy white; bark smoothish, yellowish gray on the exterior, rather bright yellow otherwise; main branches spreading, rebranched but not numerously so, the angular twigs ascending or erect; green petioles compressed and grooved along the upper side; blades ascending or horizontal, dark green above, copper brown beneath, flat, leathery, the main veins green beneath; inflorescence erect, heavy, the stalks and bracts also copper brown; the buds as well as the flowers very dark wine red.

Astronia bicolana Elm. n. sp.

A small rather gnarly tree. Stem 15 cm thick, subterete, 7 m high, chiefly branched from the middle; wood moderately hard, brownish toward the center; bark yellowish gray and minutely checked on the surface, castaneus otherwise; main branches spreading, the numerous branchlets lax and ascending; twigs thin, less than 5 mm thick, the young ascendingly curved tips dull or dark reddish brown when dry, glabrous, subangular, the older parts subterete and transversely wrinkled. Leaves subcoriaceous, ascending, nearly flat though tips are usually recurved, crowded toward the ends of the twigs in opposite

pairs, the fresh ones dark green above and chocolate brown on the nether side, when dry of the same color beneath but becoming darkened on the upper surface, entire; blades glabrous on both sides, quite variable in size, 3 by 8 cm but often smaller or even bract like, in shape broadly lanceolate to lanceolately oblong, apex gradually acuminate, base cuneate, widest across the middle; nerves 3, the midrib and a pair of lateral nerves which extend 3 to 5 mm submarginally from the base into the apex; cross bars faint, straight, ascending, also evident from the upper surface; petiole dark reddish brown on the herbarium specimen, 1 cm long or shorter, often recurved, channelled along the upper side, entirely glabrous or minutely scurf covered when young, leaving large roughened scars along the squarrose twigs below the foliage, eventually these excrescences wear off or disappear and the twigs assume a terete shape. Inflorescence terminal, erect or suberect, paniculate, 3 to 5 cm long or high, oppositely rebranched from near the base, occasionally with more than one peduncle; secondary branches divaricate, rebranched from above the middle, all densely reddish brown scale covered, subtended by minute persistent bracts or bract vestiges; bud tips yellowish green, globose; flowers fuligineous, very small, densely clustered toward the ends of the ultimate branchlets, upon short pedicels; calyx with 5 apiculate teeth; petals white and reddish tinged on the outer side; stamens bright yellow.

Type specimen number 16107, discovered by *A. D. E. Elmer* upon a densely wooded ridge at 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May 1916.

Related to *Astronia pulchra Vid., Astronia purpuriflora Elm.* and *Astronia viridifolia Elm.* It was distributed under a wrong name.

Astronia bulusanensis Elm. n. sp.

A small erect tree. Stem terete, up to 2.5 cm thick, 8 m high, more or less crooked, branched from below the middle but especially toward the top; wood dingy or yellowish white throughout, soft, odorless and tasteless; bark scaling in thin plates, yellowish to gray in age; the branchlets ascending or suberect and often curved; twigs angular and narrowly ridged, rather coarse, 1 cm thick when dry, fumosus but leather brown when dry, glabrate or the young portion covered with minute similarly colored scales. Leaves rigidly coriaceous, not numerous, opposite, nearly flat, horizontal and ascending, subglaucous or copper green beneath, brighter green above, curing gray beneath and dull green above, quite brittle in the dry state, glabrate, entire; largest blades 14 by 26 cm but others are much smaller, widest across the middle, elliptic or the younger ones obovately elliptic, with a short acute apex, base obtuse; petioles stout, varying from 3 to 8 cm in length, flat or shallowly caniculate along the upper side, in the early state sprinkled with dark brown flat scales, at the base usually subtended by a pair of persistent light gray button shaped glands or discs; nerves 3, extending from near the base into the apex, much raised beneath, very dark brown and usually sprinkled with minute flat scales, with a submarginal nerve running 5 mm below the edge of the leaf; cross bars divaricate, parallel, quite evident on the lower surface when dry, numerous. Infructescence erect or nearly so, terminal, upon stout angular rusty brown stalks, branched from below the middle, 15 cm long, nearly as wide across the lowest pair of branches, the smaller lateral opposite branchlets rigid and subterete, all dark furfuraceous and subtended by pairs of grayish white protuberances; pedicels 3 to 5 or even 8 mm long, usually 3-clustered and terminal. Fruits likewise brown when dry, dull green when fresh, 5 to 8 mm thick, flatly globose,

with a large calyx rim at the top, dehiscing by laceration from apex to the persistent pedicels.

Type specimen numbers 14979 and 17036, discovered by *A. D. E. Elmer* in humid depressions at 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915 and August 1916 respectively.

Related to *Astronia candolleana Cogn., Astronia platyphylla Merr.* and *Astronia consanguinea Merr.*

Astronia pacifica Elm. n. sp.

Shrubs or shrub like, erect or suberect, with 1 dm thick stem. Stem up to 15 cm thick and 5 m high, subterete, branched toward the top or from above the middle; wood soft, white and with a yellowish tinge, covered with a smooth yellowish gray to grayish brown bark, otherwise latericius, when old often longitudinally checked; main branches ascending, rebranched, the long twigs also ascending or ascendingly curved, terete; tips of the branchlets 5 mm thick, in the young state covered with dirty brown or nearly black scales which soon wear off; bud bracts varying from 1 to 2 cm long, lanceolately oblong, coriaceous, thickly clothed with yellowish brown scales, deciduous, brittle in the dry state, 5 mm wide, usually folded or conduplicate. Leaves opposite, coriaceous, brittle when dry, horizontal or the young ones ascending, flat, entire, mostly clustered toward the ends of the twigs, distal ends abruptly recurved, much lighter green beneath in the fresh state, curing dull yellowish brown especially on the upper side, varying from 10 to 15 cm long without the petioles, narrowly to broadly oblong, more gradually tapering toward the base, apex acute or sharply so and rather abrupt, glabrous on both sides, under a lens appearing blistery gray, usually 3 to 5 cm wide across the middle or widest portion, sometimes narrower or wider;

petioles strict, rather slender, from 3 to 5 cm in length, deeply caniculate along the upper side, the upper edges densely provided with dull brown fugaceous scales, base usually somewhat expanded and subtended by a pair of persistent gray colored wart like glands; main nerves 3, extending from the base to the apex, raised beneath, narrowly impressed on the upper side, with a faint submarginal nerve; cross bars numerous, strict, ascending, parallel, more conspicuous beneath. Infructescence shorter, branches divaricately spreading, angular, covered with a dirty brown deciduous scurf, dull green when fresh but reddish brown on my herbarium specimen; flowers terminal, either opposite or in 3 terminal clusters, upon 5 to 10 mm long or shorter stalks which upon falling leave conspicuous gray scars, rigid, subpendant, odorless, caducous; petals cremeus except the upper basal wine red portion; filaments erect, incarnatus; the incurved anthers cremeus on the outside, deep yellow along the inner face. Fruits flatly globose, minutely scurfy, 8 mm across, constricted at the top by the persistent calyx rim.

Type specimen numbers 16526 and 17072, discovered by *A. D. E. Elmer* in a very wet and humus covered soil of steep forested inclines at 3000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July and August 1916.

Related to *Astronia loheri Merr.* and *Astronia lagunensis* of the same author.

Astronia piperi Merr.

Field-note for 16647, also see number 17355: — A small though erect tree in woods along a creek embankment of more or less stony ground at 750 feet; stem 6 inches thick, subterete, 15 to 20 feet high, branched from below the middle; wood soft, dingy or yellowish white;

bark light ashy gray, the epidermis scaling in thin more or less irregular plates, hypodermis green, otherwise brownish; main branches long, divaricate, laxly rebranched; coriaceous leaves horizontal, tips twistingly recurved, dull green above, glaucous beneath; inflorescence erect, the stalks brownish, the buds and calyx isabellinus, petals cremeus, stamens ochraceus.

Astronia purpuriflora Elm. n. sp.

Small or little trees. Stem 2 dm thick or less, 7 m high, terete but somewhat crooked, branched from the middle; wood moderately hard, reddish tinged especially toward the center; bark nearly smooth, dull brown, testaceus except the epidermis; main branches repeatedly rebranched, the ultimate ones lax; twigs on my specimen 3 to 5 mm thick, longitudinally wrinkled in the dry state, terete, gray, profusely leaf bearing toward their ends, glabrous even the young portion, more or less compressed or angular along the leafy parts. Leaves crowded toward the distal ends of the relatively short branchlets, coriaceous, glabrous, opposite, 5 to 8 mm apart or the lower pairs further apart, horizontal, entire but margins subinvolute, in the fresh condition much lighter green beneath, curing dark brown above and subviridis below; blades much varying in size, in shape broadly oblanceolate for the smaller ones, the larger ones narrowly elliptic, apex slender and sharply acuminate, base mostly narrowly cuneate, the larger leaves 3 by 8 cm, the smaller ones 1 by 3 cm without the petioles, widest across the middle or just above it; nerves 3, from base to apex, the midnerve much stronger than the lateral pair which run 3 to 5 mm below the edges of the blade, glabrous, yellowish but curing reddish brown, raised beneath especially the midnerve, impressed along the upper surface; cross bars very faint below, ascending, straight; petioles 1 to 2 cm long, usually only 1.5 cm, yellowish when fresh, turn-

ing dark brown when dry, also glabrous throughout, very slender, grooved along the upper side, frequently, curved. Inflorescence subcorymbose, terminal, light fulvus, its 1 to 3 main and erect stalks subtended by a pair of small leaves, up to 5 cm long, fully as wide across the lower branches; peduncle angular and fluted along the sides, reddish brown scurfy; the secondary branchlets divaricate, comparatively slender, subtended by minute bracts or bract vestiges; pedicels relatively short; calyx short cup shaped, with 5 prominent teeth, similarly covered with fulvus scales; the petals and the style deep red; anthers aurantiacus. Old fruits lacerating from apex toward the base.

Type specimen number 16350, discovered by *A. D. E. Elmer* along a wooded ridge at 1000 feet altitude and facing the Pacific ocean, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June 1916.

Related to *Astronia gitingensis Elm.*, *Astronia viridifolia Elm.* and *Astronia glauca Merr.*

Astronia ramosii Merr.

Field-note for 15742: — A little tree in wet stony ground of dense woods along a stream at 1000 feet; stem 10 inches thick, 20 feet high or higher, crooked, subterete, branched from the middle; wood comparatively hard, yellowish white throughout, odorless, tasteless; bark rather thick, the epidermis scaling in thin rather fine yellowish plates, otherwise avellaneus; main branches also crooked, spreading, the ascendingly curved twigs quite lax; leaves ascending or horizontal, coriaceous, much lighter green beneath, when old becoming light rusty brown on the lower side; young fruits erect, pale green, not rigid.

Astronia sorsogonensis Merr.

Field-note for 16388: — A shrub like tree in very moist densely forested flats at 2000 feet; stem 5 inches thick, ascending, subterete, 15 feet high, branched from the middle; wood soft, yellowish white; bark smooth or minutely checked, yellowish gray, castaneus otherwise; branchlets numerous, very lax, ascendingly curved; leaves submembranous, horizontal, flat, much lighter green beneath; inflorescence erect, the buds and petals pale yellow; the stalks and calyx greenish; the young fruits dark green.

The relation of my specimen is not with *Astronia acuminatissimum Merr.* as by his Enumeration of Philippine Flowering Plants.

Beccarianthus ickisii setosus Merr.

Field-note for 16514, also see number 14690: — Nearly erect trees in wet humus covered black soil of dense forested flats at 2000 feet; stem more than a foot thick, crooked and wadded, 25 feet high, branched toward the top; wood dingy white or yellowish tinged, moderately soft, odorless, rather tasteless; bark yellowish brown or gray, coarsely checked longitudinally, isabellinus otherwise; main branches ascending, spreading, comparatively with few branchlets, crooked and terete; the twigs ascending, 1 inch thick; the ascending or horizontally spreading succulent petioles reddish tinged, otherwise green, flattened along the upper side, with yellowish gray coarse hairs along the sides; the big blades chiefly horizontal, subchartaceous, alternatingly clustered along the distal ends of the twigs, much paler beneath; veins yellowish beneath; flower clusters dense, the stalks and bracts reddish brown, the buds, flowers and old calyx dark miniatus; buds erect, odorless flowers pendant; petals imbricately twisted into a tubular shape, the exposed sides miniatus,

otherwise cremeus, thick, early falling; filaments incarnatus, their tips as well as the anther backs miniatus; infructescence erect, reddish tinged, from the leaf axils or subterminal, the exterior with cream colored excrescences. Exceedingly showy and pretty!

Creochiton diptera Elm.

Field-note for 16671: — An epiphytic shrub in humid forested depression at 2000 feet altitude on the Pacific side; stem terete, twining, very tough, rebranched and forming tangled masses; the soft greenish wood covered by smoothish brown bark; the main branches 0.5 inch thick; the ascending twigs green and brown pubescent; leaves ascending from the petioles, nearly flat, coriaceous, much lighter green beneath; inflorescence divaricate or ascending, the stalks with calyx greenish, the bracts yellowish green or sulphureus; petals white or creamy white, filaments green, style roseus; anthers dark lilacinus except the yellowish basal tips.

Dissochaeta acmura Stapf & Grn.

Field-note for 16844, also see number 15257:—Sprawling epiphytic shrubs in jungled woody depressions of wet more or less sandy ground at 1000 feet altitude facing the Pacific; stem bendable, 1 inch thick, terete, occasionally branched; the main branches long and drooping, flexible, the long green twigs tough; wood soft and porous, greenish as is also the large pith; bark relatively thick, isabellinus except the lighter colored longitudinal checks, the inner portion of the same color as the woody tissue; coriaceous leaves descending, lucid on the upper folded side, much paler green beneath or relatively yellowish green, the veins distinctly yellow; flowers and fruits erect, yel-

lowish green except the whitish petals on the exposed sides, otherwise lilacinus; style also whitish, filaments greenish above the middle, anthers purpureus.

Medinilla bakeri Elm. n. sp.

Low sprawling and rambling suffrutescent shrubs. Stem or stems decumbent from large bowlders or rambling over moist talus beds near cliffs, crooked, terete, 1.25 cm thick at the base, sparingly branched or without branches; the branchlets ascending, quite rigid, also terete, drying yellowish brown, glabrous even the young green tips, bendable, occasionally long or shorter rebranched; the old bark finely checked longitudinally or striate; twigs thin and slender. Leaves opposite, not numerous, widely scattered but mostly towards the ends of the twigs, flat, horizontally spreading, velvety dark green above, coriaceous, duller beneath but purplish red tinged especially the cross bars, glabrous, entire, curing brown beneath and murinus above, gradually tapering into the sharply acuminate apex, the base rounded to obtuse or even cuneate, broadly lanceolate to elliptically oblong, sometimes ovately elliptic, largest blade 25 cm long without the petiole by 10 cm wide across the middle or just below it, the smaller blades 3 by 9 cm only and broadly lanceolate in shape; nerves 2 to 3 pairs besides the midrib which is more pronounced than the lateral nerves, the 3 pairs of the larger blades arising from near the base of the leaf, all extending into the apex except the outer pair which terminates half way up the blade, in the dry state all deep brown beneath, glabrous, the smaller leaves with only 2 pairs of lateral nerves and which arise 1 to 2 cm apart; cross bars faint, more evident on the nether side, purple in the fresh state; petiole of the smaller leaves 1 cm long, nearly 4 cm in length for the larger ones, yellowish brown pulverulent, channelled along the upper side, leaving large scars upon falling. Inflorescence lateral, in

small clusters, usually from the lower portion of the stem, seldom from the leaf axils, from 3 to 8 cm long, entirely glabrous, the smooth peduncles and their branches green and purplish tinged; branches mainly toward the top, short, divaricate, subtended by acute bracts; pedicels also red, 3 to 5 mm in length; flowers odorless, pale rose red, in small subumbellate clusters from the distal ends of the short branchlets, frequently more numerously clustered; calyx elongated, finely verrucose when dry, bearing an enlarged truncate rim; petals 1.25 cm long, pale white to pink; filaments whitish; anthers light yellow, horns deep blue; style pink. Fruits with their stalks red.

Type specimen numbers 14600 and 14913, discovered by *A. D. E. Elmer* in exceedingly damp and dark shaded places littered with stones and bowlders from 1000 to 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October and November 1915.

Nearest related to *Medinilla nodiflora C. B. Rob.* Named after the late *Charles Fuller Baker.*

Medinilla bulusanensis Elm. n. sp.

A laxly branched epiphytic shrub. Branches terete, slender, rigid for their size, dull brown or nearly black and becoming shredded, its wood is hard. Leaves persistent, evenly scattered, opposite, subcoriaceous, subsessile or upon very short petioles, flat, entire or nearly so, glabrous, short elliptic, apex abruptly extended into a narrowly acuminate point which sometimes is provided with minute apiculations, curing gray above and brown beneath, base rounded or broadly obtuse, the larger blades 4 by 8 cm; midrib stout toward or at the base beneath, impressed on the upper surface, the pair of lateral nerves arising 3 to 5 mm from the base and extending curvingly into the apical point, the submarginal nerves obscure and arising from near the base of the leaf; cross bars or re-

ticulations none. Peduncles ascendingly curved, usually solitary in the leaf axil, from 3 to 5 cm long, terete, filiform but with slightly thickened ends, glabrous and tan colored when dry, 2-branched at the distal end; branchlets short, subtended by persistent and sharply acuminate bracts, terminated in 1 to 3 flowers or fruits; pedicels averaging 3 mm in length, about as long as the branchlets. Fruit smooth, terminated by a crown of small blunt teeth, globose, 5 mm in diameter, light lividus when mature.

Type specimen number 17386, discovered by *A. D. E. Elmer* in the forests at 3500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

Related to *Medinilla myrtiformis* (*Naud.*) *Triana* and its allies.

Medinilla cumingii Naud.

Field-note for 15414: — A coarse subscandent epiphyte at 3000 feet altitude; the rose colored inflorescence is subpendant, the branches provided with large bracts.

Medinilla curtiflora Elm. n. sp.

A climbing and subtwining shrub. Stem terete, 1 to 1.5 cm thick, tightly attached to its host tree, up to 7 m high, mainly branched toward the top; wood hard toward the reddish brown center; bark light gray, glabrous except the furfuraceous young tips, the older branchlets more or less lenticelled; main branches divaricate or descending, the upper ones ascending, a meter long, terete, freely rebranched, the twigs lax and crooked. Leaves subcoriaceous or submembranous, horizontal or descending, anisophyllous, sometimes with nearly equal pairs, well or evenly scattered along the gray slender twigs, broadly lanceolate to lanceolately oblong or oblanceolate in shape, occasionally subfalcate, entire, obtuse to cuneate at the

rounded base, gradually tapering into the sharply acute to acuminate apex, much lighter green beneath, curing nearly equally dull brown on both sides, subsessile or very short petioled, the largest blades on my specimens 6 by 15 cm, most of them somewhat smaller or much smaller, widest across the middle or above it, puberulent especially beneath or minutely stellate; foliaceous bracts sessile, ovate, cordately rounded at the base, sharply acuminate, averaging 3 cm long by 1.5 cm wide below he middle, membranous, also entire, the 3 nerves stellately brown pubescent beneath, the larger foliaceous bracts 5 cm long and nearly one half as wide; short petioles comparatively thick, densely covered with a cinnamon brown indumentum; lateral nerves 2 pairs, the basal pair arising 1 cm above the base of the blade and extending half way up the blade, the upper pair arising 2 to 3 cm above the base of the blade and extending into the apex, all yellowish brown puberulent on the lower surface; cross bars faint or obscure. Infructescence chiefly scattered along the branchlets but frequently along the stem, usually arising from the fallen leaf axils; peduncle with the few and very short divaricate branches averaging 1 cm long, sometimes 2 or 3 peduncles arising from the same point; pedicels or branches persistent and subtended by irregular bracts, all brown pubescent; fruits sessile or nearly so, subtended by a few lamellate bracts; these bracts are 1.5 cm long, stipitate below the middle, the expanded portion ovate to subrotund, thin, whitish to deep red, deciduous or rather persistent; calyx densely covered with persistent grayish white bristles, crowned by 5 small teeth. Fruit at first dark green, soft and turning purplish black when fully mature.

Type specimen numbers 14368, 15643 and 15179, discovered by *A. D. E. Elmer* climbing small tree trunks or along the sides of an old stump in rocky ground at 1000 to 1500 feet altitude, Irosin (Mt. Bulusan), Province

of Sorsogon, Luzon, October to November 1915 and April 1916.

Related to *Medinilla attenuata Elm.* and *Medinilla involucrata Merr.*

Medinilla disparifolia C. B. Rob.

Field-note for 14511:— Low and sprawling shrubs in very wet ground of a densely wooded depression at 2500 feet; stem 1 inch thick, repeatedly branched from near the base, 5 to 10 feet high or long; bark roughened with excrescences, otherwise yellowish; wood soft, sappy or yellowish white; horizontal leaves subcoriaceous, paler green beneath; inflorescence pendant, the flowers whitish; fruits pale purpureus.

Medinilla epiphytica Merr.

Field-note for 15818, also see numbers 15651 and 16378: — Epiphytic shrubs among other vines in the lower limb axils of large trees in a very humid depression at 1250 feet; stems several, 0.5 inch thick and a yard long, not numerously rebranched, chiefly descending; bark avellaneus, smooth; wood soft, greenish white, with a large pith; leaves heavy, thick, very rigid, paler green beneath; peduncle terete, ascending while the foliage is descending, pedicels red; calyx pale white; petals purple at the base, blending to the upper or larger whitish portion; style lilacinus; filaments and anther horns lividus, only the 3 short basal projections pale creamy white.

Medinilla myrtiformis (Naud.) Triana

Field-note not given for 14881.

Medinilla nodiflora C. B. Rob.

Field-note for 14846, also see number 14602: — A low or rambling undershrub or sprawling over large bowlders

in a very damp deeply wooded flat at 1000 feet along a streamlet; stem flexible, 0.5 inch thick, more or less angular, repeatedly branched, the ultimate leaf bearing branchlets suberect; wood tough, whitish, brown in the center; bark greenish gray, rather smooth; leaves heavy and coriaceous, horizontal, yellowish green beneath; the ascending terete petiole reddish tinged; inflorescence cauline and from the branches, from the base ascending, the stalks red; petals pale white, filaments of the same color; pistil pink; anther horns blue, anther sacs light yellow; fruits dark purple, their stems light purple.

Medinilla pachyphylla Elm. n. sp.

A subscandent and densely matting epiphytic shrub. Primary stem 5 to 8 cm thick, crooked and curved, repeatedly rebranched; wood not hard but tough, sappy white; bark grayish, smooth or when old becoming shredded; branches rigid, mostly ascending, frequently curved, the older ones lenticelled or excrescent, roughened by the old leaf scars, glabrous. Leaves leathery, also glabrous, scattered along the twigs, 2 to 5 cm apart, usually in whorls of 3 or 4, rarely opposite, much lighter green beneath, glossy dark green above, easily falling while curing, leaving large rounded scars along the leaf bearing branchlets; blades up to 8 cm long without the petiole, the average ones about one half as wide a little above the middle, often much smaller, dull brown beneath when dry, blackish to grayish brown above, obovately elliptic, apex broadly rounded and terminated into a short blunt point, base cuneate, the entire margins rather thin; nerves 3 including the stout and straight midnerve, the lateral pair curvingly extending from the base into the apex, from 5 to 8 mm below the edge of the blade, all the nerves conspicuous

from the lower side, scarcely evident from the upper side on my dry specimen; cross bars obscure; petiole 1 cm long more or less, narrowly caniculate along the upper side, gradually expanded into the blade, base rounded, not flattened, upon falling leaving comparatively large circular scars along the branchlets. Inflorescence clustered, axillary from stem and branches, glabrous throughout, greatly varying in length from 1 to 5 cm or even longer, rigidly short branched, all the branches smooth, lucid and coriaceous; flowers not numerous, upon 5 mm long pink pedicels which turn copper brown when dry; calyx thick and quite hard, mostly green in color, copper colored when cured, with a broad truncate rim; petals 1 to 1.5 cm long, deciduous, nearly white or tinged with red; anther prongs light yellow.

Type specimen number 17094, discovered by *A. D. E. Elmer* upon tree trunks thirty feet above ground in damp woods at 2500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Related to *Medinilla subumbellata Merr.*, *Medinilla megacarpa Merr.* and *Medinilla affinis Merr.* My numbers 16440 and 14976 from this same locality are doubtfully referred under this species.

Medinilla peltata Merr.

Field-note for 14833: — Scandent upon or along middle sized tree trunks in an extremely humid wooded or forested flat of wet stony ground along a stream at 1000 feet; stem solitary, terete, 0.5 inch thick, very flexible, up to 20 feet long and relatively short branched toward the top, taking roots or rootlets along the side facing the host; bark lenticelled or excrescent, grayish green except the thick inner portion which is reddish; wood tough, sappy white, pith quite large; branches divari-

cate, rather rigid, 1 to 3 feet long, seldom rebranched, the young tips angular but not winged; the green petioles terete, ascending; blades horizontal, thick, heavy, coriaceous, shining on both sides, much darker green above; infructescences in small divaricate or descending clusters all along the stem from the ground up to the branches, their stalks as well as the thick ellipsoid fruits light purpureus in color.

Medinilla peninsula Elm. n. sp.

An epiphytic and subscandent shrub. Stem 5 cm thick at the base, ascending, loose and somewhat looping, freely rebranched from near the base, the branches twining among the limbs of their support; wood relatively hard. porous when young, dingy or yellowish white, brownish in the center; bark thick, thinly checked longitudinally, yellowish gray to brown; branchlets smooth, the young ones green, when old thick and rough, curing dull brown, the young ones glabrous and terete, ascending, the ultimate ones descending, divaricately rebranched all along, 1 to 2 m in length. Leaves coriaceous, ascending, flat, normally 4 in a whorl, widely scattered, diverse in size, much lighter green beneath, drying similary dull green on both sides, entire, apex acute to short acuminate, gradually tapering toward the base, oblong to broadly oblanceolate, sometimes elliptically elongated, the larger ones 8 cm wide across the middle and 2 dm. long, frequently smaller, subsessile, leaving large scars upon falling, in their axils provided with a coarse brush of yellowish brown persistent bristles; midrib stout and compressed toward the very short and similarly shaped petiole, glabrate, dark brown when dry, extending straight into the apex; lateral nerves 2 pairs and much less conspicuous, arising from below the middle or 1 to 4 cm from the base of the blade, ascending and curvingly extended into or near into the apex; cross bars none or very obscure. Inflorescence entirely

glabrous, pendant from the leaf axils, up to 18 cm long on my specimen, the slender peduncle and main branches appearing compressed, pyramidally paniculate, the lower or longer branches arising from below the middle and divaricately spreading in whorls, the upper whorls gradually reduced, 8 cm wide across the basal branches; secondary branches from above the middle or toward the top, short and divaricately spreading, terminated by whorls or subumbellate clusters of flowers; pedicels 5 to 8 mm long, slender, subtended by minute bract vestiges; calyx granular, with very short and blunt teeth at the apex; flowers odorless, the 4 to 7 mm long petals pink to red; stamens about as long or longer. Fruits deep red even their stalks.

Type specimen numbers 14963 and 16403, discovered by *A. D. E. Elmer* in humus covered moist forests at 2250 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915 and June 1916 respectively.

Related to *Medinilla canlaonensis Merr.* and his *Medinilla subsessilis.*

Medinilla piperoides Elm. n. sp.

A spreading or subscandent shrub. Main branches lenticelled, rebranched, the terete branchlets on my specimens are 5 mm thick and yellowish brown; the young twig portion glabrous, smooth, green but turning nearly black when dry, appearing slightly verrucose. Leaves opposite, ample, persistent, flat, much darker green on the upper surface which turns nearly black when dry, the lower side curing dark reddish brown, entire, glabrous, ovately elliptic in general outline, the larger blades 12 cm long by one half as wide a trifle below the middle, the smallest ones measure scarcely half as large, gradually extended into the slender or sharply acuminate point, base broadly

rounded; midrib straight, conspicuous and more or less verrucose on the lower side; lateral nerves 2 on each side of the midrib and arising within 1 cm from the base of the blade, occasionally a faint basal pair of nerves on the larger leaves, all dull reddish brown on the lower surface, also evident from the upper surface; cross bars faint; petioles up to 2.5 cm long, slender, strict, grooved along the upper side, verrucose. Flowers laterally clustered, upon glabrous stalks up to 2 cm in length; pedicels short and thick, obscurely verrucose, subtended by caducous very linear bracts from 5 to 10 mm in length; calyx cup shaped, 1 cm long in the dry condition, as wide as the truncate apex, wrinkled or coarsely verrucose; petal whitish to pink, up to 3 cm long.

Type specimen number 16951, discovered by *A. D. E. Elmer* in the mountainous region, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Nearest related to *Medinilla megacarpa Merr.*

Medinilla purpurea Elm.*

Field-note not given for 15490.

Melastoma polyanthum Blm.

Field-note for 15083, also see number 15452: — Individual shrubs or in copses of wet humus covered soil among light woods of the hemp region at 1500 feet; stems 1 to 2 inches thick, terete, strict, 10 to 15 feet high, branched from below the middle; wood very soft, sappy white, covered with smooth testaceus bark which is darker brown beneath the skin; branches ascending, twigs numerous; leaves horizontal, subchartaceous, flat, much paler green beneath, the nerves beneath especially toward the similarly colored petiole red; calyx green except the red basal por-

---

* *Merrill* in Philip. Journ. Sci. 17 (1920) 298.

tion of the sepals; petals lilac; filaments and anther bases light yellow; style and anthers red, the stigma dull green; flowers odorless; mature fruits or calyx dehiscing irregularly, the seeded portion strawberry red and not unlike them in taste.

Melastoma setosum Elm.

Field-note for 16479: — Erect shrub in quite dense woods along a stony ridge at 1750 feet; stem 1 inch thick at least, terete, nearly 10 feet high, branched from the middle; bark smooth, yellowish gray; wood soft, greenish, with a large pith; branches divaricately spreading, rebranch, the twigs ascending; leaves horizontal, membranous, flat, dark green above, lighter and purplish tinged beneath; pubescent bristles red; flowers erect, the petals showy and rose red.

Memecylon agusanense Elm.

Field-note for 15945, also see number 17404: — An erect shrub like tree on a forested ridge at 1500 feet altitude in well drained stony ground; stem 4 inches in diameter, 15 feet high, branched from below the middle; wood brownish especially in the center, odorless and without taste, hard; bark smoothish, testaceus; main branches widely spreading, repeatedly and laxly rebranched; leaves rigidly coriaceous, recurved toward the tips, lucid above, paler and duller green beneath; inflorescence suberect, yellowish green, the corolla pale blue or whitish.

The above numbers were first thought to be distinct species, and so were distributed under new names. They are only variations of the above specific name.

Memecylon cumingii Naud.

Field-note for 14933, also see number 17294: — A low undershrub on wet humus covered ground among

stones of a very steep wooded slope at 1500 feet; stem 0.75 inch thick, 1 yard high, few branched from the base, terete, rigid; wood quite hard, reddish tinged in the center, odorless and tasteless; bark dull gray, relatively thick, minutely checked longitudinally; the few twigs spreading, crooked, the young portion terete and yellowish green; leaves horizontal or descending, rigidly chartaceous, much lighter green beneath; fruits pale pink, upon yellowish green more or less angular stalks, the small clusters arising from the basal portion of their main stalks.

Memecylon lanceolatum Blco.

Field-note for 17168, also see number 15266: — Tree with a foot thick stem and with hard wood; fruits green, red, cyaneus and nearly black or very dark or deep cyaneus and shining when mature.

Memecylon sorsogonense Elm.

Field-notes not given for neither 15533 nor for 17184.

Type specimen 7310 for the flowers was first collected by me at Matnog, Sorsogon province, Luzon, November 1905. The fruiting specimen 7361 was collected at Palo, Leyte three months later.

Osbeckia chinensis Linn.

Field-note for 16027: — Perennial herbs in dry compact black ground of cogon flats at 750 feet; stems green, angular, few branched, the branches also erect; leaves divaricate, membranous, flat, much paler beneath; spreading petals rose red, the anther tips bright yellow, the basal portion brownish; filaments white.

Pogonanthera reflexa Blm.

Field-note for 15796: — A lax epiphytic shrub upon vine clad large limbs of trees in humid secondary forests of depressions among the hemp region; stems few to several, very flexible and occasionally branched, descending, 0.5 inch thick, a yard long or shorter; leaves coriaceous, much lighter green beneath, smooth, flat, horizontal or descending; the erect infructescent stalks green but becoming reddish brown tinged; fruits green or turning yellowish; calyx with petals yellowish, the style of the same color; anthers in the bud state fiery red and turning whitish when old; filaments also whitish.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, A. M.

Vol. X | Manila, P. I., November 5, 1939 | Art. 136

MISCELLANEOUS NEW SPECIES

by

A. D. E. ELMER

———x———

ACANTHACEAE

Hemigraphis diversifolia Elm. n. sp.

Herbs, more or less forming mats. Stems varying from 5 to 15 cm in length, mainly ascending, filiform, arising from fibrous roots, often bent or geniculate toward the base, more or less beset with minute hairs, when old becoming glabrate, dirty brown on my specimen, occasionally branched; branches very short, ascending, puberulent, very slender. Leaves opposite, scattered or more abundant toward the distal ends of the stems or branches, much paler beneath even in the dry condition, glabrate on both sides and with obscure cystoliths, very thin, dull and much darker colored on the upper side on my herbarium specimen, the larger blades 3 cm long by 1.5 cm wide toward the base, the smaller blades scarcely 1 cm in length, greatly varying in shape from ovate to lanceolate, gradually tapering to the rather blunt apex, base obtuse to truncately rounded, entire or only very minutely undulate along the sides of the larger blades; midrib faint on both sides;

MISSOURI BOTANICAL RECEIVED DEC 13 1939 GARDEN LIBRARY

nerves exceedingly faint, 3 pairs on the larger leaves, ascending, reticulations none; petioles 3 to 10 mm in length, brown pubescent in the young state, divaricate or ascending. Inflorescence erect, terminal from the uppermost leaf axils, soft and yellowish brown pubescent, 2 to 3 or even 4 cm in length; peduncles strigose when young, slender, straight and ascending or somewhat recurved toward the upper end, subtended by variously sized foliaceous bracts, very short branched from above the middle; the branchlets usually opposite, divaricate, subtended by greenish and very small foliaceous bracteoles; pedicels short in length and short in pubescence; calyx 5 to 8 mm long, unequally divided into 5 segments from apex toward the base; the segments setaceously pointed, ultimately spreading, green in the fresh state, minutely strigose on the outside; corolla up to 1 cm in length but often shorter, tubular at the base, the upper portion clavate and bearing short rounded lobes at the top which is usually fine pubescent on the exterior. Capsule erect, rigid, light brown, 7.5 mm long, ridged longitudinally, dehiscing into 2 strongly recurved carpels.

Type specimen number 15398, discovered by *A. D. E. Elmer* in loose soil of more or less shady places, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, December 1915.

Nearest to *Hemigraphis fruticulosa Clarke,* more distantly related to *Hemigraphis bakeri Merr.*

Hemigraphis subtinctoria Elm. n. sp.

Annual or biennial herbs, forming scattering patches. Stems 1 dm long, occasionally longer, frequently shorter, often kneed toward the base and provided with a fibrous mass of roots, ultimately ascending and erect, subfiliform, dark brown, short strigose or glabrate, rather numerous

from the root cluster; branches ascending, shorter than the main stem, usually opposite, divaricate, similarly hairy. Leaves many, diverse in size, opposite, membranous, the basal ones much smaller than the upper blades, well scattered along the stems and branches, the larger leaves 5 cm long without the petioles by 1.25 cm wide toward the base or widest portion, sublanceolately oblong, the entire margins obscurely undulate along the edges, base truncate or truncately obtuse, gradually tapering from the base to the bluntly rounded apex, sublucid on the upper surface, lighter and with a distinct metallic luster on the lower side, flat and horizontally spreading, glabrous but cystoliths evident from the upper face, the lower leaf blades shorter but broader in proportion, ovate in shape and average 1 to 2 cm in length only, the terminal leaves subtending the inflorescences are linear to narrowly lanceolate; midrib strict, brown beneath and with scattering hairs and cystoliths; nerves normally 3 or 4 pairs, faint, divaricate, curved with tips interarching, reticulations none; petioles very slender, 5 to 10 mm long or those of the smaller leaves much shorter, thinly pubescent. Inflorescence ascending from the upper leaf axil, scarcely longer than the foliage, the longer ones 5 cm long but quite variable in length, more or less strigosely pubescent; peduncles filiform, erect and ascending, 1 to 3 cm long, very short branched from the top, subtended by foliaceous leaves; the very short branchlets bearing the small clusters of flowers subtended by flat and ligulate leaf bracts; flowers subsessile, 1 cm long, subtended by bracteoles, pale pink or purplish; calyx shorter, normally divided into 5 setaceous sepals clear to the base. Capsule as long, narrowly oblong, brown, deeply grooved longitudinally.

Type specimen number 15430, discovered by *A. D. E. Elmer* in rich soil of slightly shaded woods, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, December 1915.

Distinct from *Hemigraphis diversifolia Elm.*, differing in the metallic leaf color, larger and smaller leaves with different shapes and by the floral bracts.

Polytrema irosinensis Elm. n. sp.

Chiefly growing in terrestrial tufts. Stem or stems 2 to 3 or even up to 5 dm long, frequently short branched toward the top or from above the middle, subherbaceous except the rigid basal root portion, rather slender, terete, glabrate; roots very wiry; branches few or none, ascending, when young minutely dirty brown pubescent or pulverulent in the dry state. Leaves very membranous, opposite, more or less crowded toward the top, subelliptic to ovately oblong in shape, entire, with acute to acuminate apex, base broadly obtuse to rounded or broadly rounded, curing lighter green beneath, glabrous, sprinkled on both sides with fine cystoliths, 5 to 8 cm long without the petioles, 2.5 to 3.5 cm wide across the middle or a little below it; midrib conspicuous and brown pubescent beneath, narrowly grooved and sprinkled with similarly colored hairs on the upper surface; nerves usually 5 on each side of the midrib but much finer, ascendingly curved, faintly brown colored with fine hairs and cystoliths, reticulations none; petioles strict, ascending, very slender, leaving rough scars upon falling, varying from 1 to 2 cm in length. Inflorescence terminal or from the terminal leaf axils, 2 to 4 cm long, erect or ascending, greenish even in the dry condition, pulverulent; main stalks occasionally branched toward their distal ends, profusely bracteated toward the flower bearing portion; pedicels short, also provided with minute hairs in the young state, subtended by setaceously pointed bracts; calyx greenish, averaging 1 cm long, divided into 5 setaceously pointed segments which are very linear and recurvingly spreading towards their apices; corolla glabrate except around the top in the bud state,

equalling the calyx segments in length, whitish or pale pink. Capsule 1 cm long or longer, clavate, long stipitate at the base, rigid, brown on my specimen; carpels strongly recurved in dehiscence, costately ridged along the back from apex toward the stipe.

Type specimen number 15491, discovered by *A. D. E. Elmer* in loose ground of open places, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, December 1915.

Polytrema philippinensis Merr. from mount Maquiling, but ours is at once recognized by the long slender petioles and by the more broadly rounded leaf bases.

Polytrema macgregorii Elm. n. sp.

Small terrestrial clumps. Stems 2 to 3 dm long more or less, herbaceous but rigid toward or at the fibrous root cluster, erect or ascending, very slender and subterete, puberulent toward the distal end, minutely fluted longitudinally and short brown pubescent, sparingly rebranched, usually slanting or crooked at the root bearing portion. Leaves not numerous, widely scattered but mostly at or near the top, very unequal in size, thin, dark green especially on the upper surface, curing much paler green beneath, opposite, linear to linearly lanceolate, up to 15 cm long, most of them shorter, averaging 1 cm wide, entire but margins distinctly wand like or obscurely wavy, the smallest blades 3 cm long by 7.5 mm wide or much narrower, gradually extending into the slenderly acuminate apex, sometimes obtusely rounded at the apex, the larger blades slenderly tapering toward the base or obtuse to obtusely rounded at the base, cystoliths very minute and obscure on both sides, otherwise glabrous; midrib relatively conspicuous beneath, brown and more or less pubescent on the lower surface; nerves also obscure, ascending or ascendingly curved and terminating into the coarse undulations along the margins, reticulations none; petioles 5

to 15 mm in length, strict, very slender, covered with a fine brown colored pubescence. Inflorescence terminal or from the uppermost leaf axils, 3 cm long on my specimen; peduncles as slender as the upper petioles, furfuraceous, erect or ascending, usually solitary from the leaf axils, from 1 to 3 cm long, often bracteate from above the middle, bearing from 1 to 3 flowers at their ends; pedicels very short, subtended by sharply pointed bracts; calyx greenish, linearly setaceous, up to 1 cm long or much shorter in the bud state, glabrate or furfuraceous, usually 5-segmented to the base and ultimately spreading; corolla pale pink, about 1 cm long. Capsule a trifle longer, rigid in texture, tan in color, slenderly stipitate, clavate, dehiscing into halves from apex toward the base, each carpel costately ridged on the dorsal side from apex toward the base.

Type specimen number 15352, discovered by *A. D. E. Elmer* in well drained soil, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

Named after the late *Richard C. McGregor* who also collected typical specimen of it in the province of Laguna, Bureau of Science number 22915.

Strobilanthes bulusanensis Elm. n. sp.

Rather coarse terrestrial plants. Stems 3 to 5 dm high, branched toward the top; branches black when dry, glabrous, angular, grooved along its sides, 5 mm thick on my herbarium specimen. Leaves opposite, scattered but most abundant toward the distal ends of the comparatively short branchlets, subchartaceous, murinus on both sides when cured, flat, blistery on the upper side, roughened beneath, glabrous on both surfaces, broadly lanceolate or oblong with pointed ends, edges roughened and minutely involute, our largest blades 5 cm wide across the middle or widest portion by 15 cm long without the petiole,

gradually tapering to the sharply acute to acuminate apex, base less tapering or subcuneate, the branchlets and inflorescent stalks subtended by much smaller and strictly lanceolate leaves; petioles up to 3 cm in length, stout, glabrous, deeply caniculate along the upper side, expanded at the base and usually crooked just above it; midrib straight, more conspicuous beneath especially toward the base, usually provided with minute spicules; nerves 3 to 5, inconspicuous and also provided with spicules on the lower face, much ascending but only slightly curved, the whole leaf surface roughened by reticulations, occasionally finely punctate beneath. Strobiles often crooked and angular; spikes usually curved, flower bearing from near the base, subtended by foliaceous lanceolate leaves, from 1 to 1.5 dm long; flowers sessile, solitary in the axils, evenly scattered from near the base to the apex, subtended by large bracts; the 1 to 1.5 cm long bracts strictly ascending, more or less overlapping, flat, subglabrous, elliptic, sessile, finally deciduous; rachis stout, angular when dry, grooved along its sides; calyx erect, 5 to 7.5 mm long, the setaceous segments united at the base, otherwise recurved, puberulent, leaving rough scars after falling; the elongated ovary grayish pubescent at the apex. Capsule costate, shorter than the calyx, divided into two carpels.

Type specimen number 16884, discovered by *A. D. E. Elmer* among thickets, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916.

My specimens were distributed under *Hemigraphis* instead of *Strobilanthes*.

ANACARDIACEAE

Buchanania conglomerata Elm. n. sp.

A middle sized tree. Main branches spreading, the branchlets thick and terete. Leaves alternate, crowded

from the ends of the older or ultimate twigs, glabrous, entire, curing brown, apparently darker green on the upper side in the fresh state, flat, oblanceolately oblong, our leaf specimen measures 5 dm long by 10 cm wide a trifle above the middle, terminated by a short and bluntly obtuse point, the edges of the lower half of the blade gradually tapering to a slenderly cuneate base; midrib smooth, raised and rounded on the lower side, only slightly raised on the upper side, very stout toward the base; lateral nerves 32 on each side of the midrib, ascending, straight and subparallel except their much ascendingly curved tips, murinus when dry especially beneath, secondary nerves none, cross bars faint and almost at right angles to the nerves; petiole ascending, about 3 cm long, thick and expanded toward the base whose upper side is trough like, blackish brown, glabrous. Inflorescence axillary or arising from in between the leaves, suberect in the early state, elongated and thyrse like, 3 dm long or longer, sometimes shorter, alternatingly and irregularly short branched from below the middle of the inflorescence; peduncle and rachis stout, terete, greenish, dirty brown when dry, in the early state covered with a fine ferruginous pubescens, longitudinally grooved or fluted, the main stalk subtended by a thick 1.5 cm long bract; the basal or main branches 4 cm long, gradually reduced toward the top to only 5 mm in length, secondary branches very short, usually bract subtended, more or less angular, all pubescent; flowers yellowish, very numerous, densely crowded all along, very short pedicelled or subsessile, 5-merous, glabrous; calyx very short 5-toothed; petals 5, oblong, reflexed, two to three times as long as the calyx; stamens erect, the anthers bright yellow. Fruit 1.25 cm across, compressed, circular or slightly oblique from the side view.

Type specimen number 15629, discovered by *A. D. E. Elmer* in woodlands at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

Buchanania nitida Engler, but flowers densely conglomerated upon very short branchlets.

Buchanania sorsogonense Elm. n. sp.

A medium sized tree. Branches spreading, the ultimate ones comparatively thick. Leaves chiefly clustered toward the ends of the branchlets, alternate, ascendingly spreading, subchartaceous, entire, flat, glabrous, much lighter beneath and dark brown when dry, nearly black on the upper surface, 5 dm long without the petioles, oblanceolate in outline, apex terminated by a sharply acuminate point, the basal half of the blade gradually and very slenderly tapering to the base, about 10 cm wide above the middle; midrib raised beneath, ridged along the upper side, very stout especially toward the base, glabrous and smooth, dull brown in the dry state; lateral nerves less prominent, up to 24 on each side of the midrib, ascendingly curved especially toward their distal ends but do not extend or arch over into the upper adjoining nerves, secondary nerves in between the primary ones and finally form a connecting line for the cross bars to terminate into; cross bars ascendingly oblique from the base, the upper ones parallel and ascending, quite numerous, reticulations composed of very fine cross bars; petioles 6 cm long, lighter brown on my specimen, gradually thickened toward the base, transversely checked when dry, nearly flat on the upper side except at the grooved base. Inflorescence arising from between the leaves, 10 to 15 cm long, suberect, paniculately branched from below the middle, yellowish gray pubescent; branchlets alternating, the basal ones longest and divaricate, the ultimate branchlets very short; flowers upon very short pedicels, usually bract subtended, solitary or few clustered, 5-merous; calyx glabrate, 5-toothed, 1.5 mm long; petals spreading, twice as long, glabrous, oblong or subelliptic, yellowish, exceeding the stamens.

Type specimen number 15309, discovered by *A. D. E. Elmer* in dry woods at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, December 1915.

Critically related to *Buchanania nitida Engler*, less so to *Buchanania platyphylla Merr.* Neither can our specimen be referred to *Buchanania conglomerata Elm.*

Semecarpus testaceus Elm. n. sp.

A little or larger sized tree. Branches few, relatively slender and comparatively thick. Leaves apparently alternate and clustered, oblanceolate in shape, 5.5 dm long on my specimen, narrowly attenuate toward the base, apex acute to acuminate, edges entire, considerably curved from the base to the middle, upper half slightly curved, glabrous, upper side lucid and subolivaceus in the dry state, lighter green beneath and testaceus when dry, chartaceous, smooth on both sides, 15 cm wide above the middle; midrib very stout, curved, much raised beneath and obscurely ridged longitudinally, glabrous and very smooth, curing light testaceus on both sides, less raised on the upper side of the blade but equally conspicuous; nerves 20 on each side of the midrib, far less prominent yet conspicuous, light testaceus in color, divaricate, with ascendingly curved tips which arch over and connect with the upper nerves, also very evident from the upper surface; primary reticulations coarse, the secondary reticulations finely meshed, quite evident from both leaf surfaces, all smooth and glabrous; petiole 1.5 cm long on my type, strong and rigid, also smooth and glabrous, subterete, the sides toward the top very gradually edged into the leaf blade, the basal 2 cm much thickened and ascendingly curved, coarsely rugose on my specimen. Infructescence terminal or subterminal, paniculate, suberect; branches divaricate, ligneous, smooth, grayish, short rebranched from near the base; the ultimate ones or persistent pedicels 1 cm in length, brown and

puberulent; hypocarpium 5 mm long on my dry specimen, gradually thickened from base to apex, murinus; drupes obliquely reniform, 1.25 cm long and as wide across the base, compressed, brown and minutely striate.

Type specimen number 15247, discovered by *A. D. E. Elmer* in dry woods at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

Similar to *Semecarpus subsessilifolia Merr.*, but the basal portion of our long petioled leaves is very different from his species.

Spondias romblonensis Elm. n. sp.

A small burly tree. Stem 6 m high, 15 cm in diameter, branched from below the middle; branches rather short, few, thick; wood whitish, odorless, sour to taste, moderately hard, the young bark contains milky sap; twig on my dry specimen terete, 7 mm thick, yellowish brown, glabrate or only the young tip puberulent. Leaves crowded toward the ends of the branchlets, alternate, ascending but frequently with recurved ends, 1.5 to 3 dm long, pinnate or imparipinnate, coriaceous, curing blackish to brown, glabrous, leaflet bearing from below the middle; petiole slender, glabrate and yellowish brown toward the enlarged base, one half to one third the length of the entire leaf, leaving large oval scars after falling; leaflets obliquely lanceolate or oblongish, the lower edge nearly straight, the upper edge rounded especially below the middle, entire, descending or suberect, opposite or subopposite, evenly scattered, dark lucid green above, much lighter green beneath, 5 to 8 cm long, 1.5 to 3 cm wide at or below the middle, gradually tapering to the rather slender acuminate apex, base mostly obtuse, with distinctly unequal sides, ascending; midrib usually curved toward the base, dark brown, more prominent on the lower side; nerves faint, ascending, 5 to 8 or even 10 or more on the

larger and older blades, slightly more evident from beneath, reticulations fine; petiolules up to 1 cm in length, subcompressed, smooth, ascending, rachis also smooth. Inflorescence often alternating with the leaves and exceeded by them, 2 dm long, paniculately branched from above the middle, all the branches including the comparatively slender peduncle greenish in the fresh state; branches finely rebranched, the ultimate ones puberulent; pedicels divaricate, from 1 to 3 mm long, very thin, persistent; calyx leathery, shallowly cup shaped, glabrous, terminated by bluntly rounded segments, greenish white; petals 4, whitish, elliptically oblong, considerably exceeding the calyx, also glabrous; stamens erect, as many and shorter than the spreading corolla segments; filaments pinkish, anthers orange red.

Type specimen number 12164, discovered by *A. D. E. Elmer* on rocky cliffs near the sea shore at Romblon, on Romblon Island, March 1910.

Many years ago *Radlkofer* determined it as *Anacardiaceae*, not unlike *Spondias*, and it seems to differ from our other Philippine species of that genus.

ANONACEAE

Artabotrys stolonifera Elm. n. sp.

A tall tree climber. Stem 1 dm thick, irregularly round, with soft and porous wood; bark thick, dull brown, checked; most of the leaf bearing branches toward the top and forming rigid masses; branchlets tough, terete, smooth, blackish brown when dry, the twigs often sprinkled with small light gray lenticels, relatively short. Leaves alternately scattered, chartaceous, somewhat darker green upon the upper shallowly folded side, curing brown, entire, glabrous, oblong or subelliptic, the larger ones 12 cm long by 5 cm wide across the middle or widest portion, apex

acuminate or sharply acute, base obtuse; petioles stout, 5 to 8 mm thick; midrib pronounced beneath and in the younger state strigose, brown when dry, becoming glabrate; nerves 7 to 9 on each side of the midrib, ascendingly curved, less conspicuous, their tips more or less interarching, glabrate, reticulations fine and obscure. Inflorescence occasionally from the lower leaf bearing branchlets but usually along specialized branches or stolons arising from the basal portion of the stem and which stolons infrequently bear leafy twigs; the flower bearing main branches are long, slender and pliable; these flexible runners extend 10 to 15 m in length, scattering upon the undershrubs, over bowlders or even lying upon the wet ground; the flowering twigs arise from very thick and recurved hooks, the twigs themselves are sometimes 10 cm long and quite slender; flowers odorous, clustered along the hooked portions, widely scattered, dark cinnamon brown pubescent, their bases very short and provided with short densely pubescent bracts; pedicels straight, up to 3 cm long, also densely olivaceus pubescent; calyx 5 to 7.5 mm long, sharply acute, 3 in number, spreading, persistent, similarly pubescent; petals diverse in size, 2 to 3.5 cm long, 1.25 cm wide, narrowly oblong, when young densely light brown hairy on both sides, tapering into the acuminate apex, usually 3 and thickened at the base.

Type specimen number 14610, discovered by *A. D. E. Elmer* in wet ground of dense woods of a depression at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

A very interesting species of *Artabotrys* with its long inflorescent stolons.

Mitrephora multifolia Elm. n. sp.

A little or small sized tree. Stem 3 dm in diameter, 10 m high, terete, somewhat crooked, with main branches from

above the middle; wood moderately hard, whitish on the outside at least; bark smooth, brown and gray blotched, 2.5 cm thick, avellaneus except the surface; primary branches ascending, finally widely spreading and freely rebranched; twigs numerous, comparatively short, lax, erect or ascending, the older ones blackish when dry and covered with light brown lenticels, terete, the young twigs brown puberulent. Leaves very numerous, alternate from the branchlets, variable in size, coriaceous, most of them descending, entire, glabrous, sublucid on the upper darker green surface, curing brown on both sides, flat or curvingly folded on the upper side, broadly lanceolate to subelliptic or ovately oblong, 3 cm wide across the middle or a trifle below this on the larger blades, varying from 5 to 8 cm in length without the petioles, gradually tapering into the acute to slenderly acuminate apex, base rounded or sometimes broadly obtuse, curing grayish on both sides; midrib pronounced beneath, minutely grooved above, dark brown and glabrate beneath; nerves 5 to 7 on each side of the blade, ascendingly curved, relatively obscure beneath especially their distal ends; reticulations very fine and more evident from the nether side; petioles 5 to 8 mm long, murinus, rugose, glabrate when old, widely grooved along the upper side, persistent. Flowers recurved, odorless, yellowish green, alternatingly grouped along the 1 to 3 cm long brown pubescent stalks or cymes which are terminal or arise opposite the upper leaves; pedicels very short or none, subtended by blunt and densely cinnamon brown pubescent bracteoles; calyx similarly pubescent, united at the base, very short 3-segmented; petals free, oblong, up to 1.5 cm long, appressed hirsute on the outside, glabrate on the inner side except at the apex, the inner ones a trifle smaller and substipitate at the base.

Type specimen number 16152, discovered by *A. D. E. Elmer* upon a nearly precipitous woody slope at 1750 feet

altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May 1916.

Flowers larger than those on *Mitrephora basilanensis Merr.*

Mitrephora sorsogonensis Elm. n. sp.

A small and erect tree. Branchlets many, 5 mm thick, terete, gray and brown mottled, wrinkled, glabrous but the young slender twigs densely fulvus pubescent, sparingly lenticelled on the older ones. Leaves alternate, easily falling, lanceolate to oblong, the larger blades 5 cm wide by 15 cm long, the lanceolate ones 2 by 8 cm in size, gradually tapering to the acute to acuminate apex, also tapering to the obtuse or subcuneate base, entire, chartaceous, smooth and sublucid on the upper surface, paler green on the lower side, curing equally brown on both sides, the young leaves fulvus pubescent especially on the lower face, soon becoming glabrate; midrib raised beneath, plane on the upper surface, lighter brown below in the dry condition, hairy when young, otherwise glabrate or only sparsely strigose toward the base; nerves 5 to 8 on each side of the midrib, less conspicuous beneath, much ascending but only slightly curved, becoming obscure toward their distal ends, glabrate, similar in color to the midrib; reticulations obscure beneath, quite evident from the upper face; petioles deciduous, leaving large scars, 5 to 8 mm long, relatively thick, broadly grooved on the upper side, transversely rugose beneath, minutely brown pubescent. Flowers terminal or lateral, upon very short and stout fulvus branches, solitary or few to severally clustered, sessile, subtended by ovately elliptic bracts which are caducous and densely covered with a light tawny colored pubescence; outer floral parts sulphureus, the inner parts atropurpureus; calyx segments ovate, densely covered with strigose hairs; outer petals oblong, 1.5 cm long, pubescent

on the outside, free, puberulent on the inner face; the larger or inner petals narrowed toward the base, also free, deciduous, pubescent on the outer and puberulent on the inner side.

Type specimen number 17178, discovered by *A. D. E. Elmer* in secondary forests, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

Nearest related to *Mitrephora pictiflora Elm.*, but distinct in foliage and inflorescence.

Orophea vulcanica Elm. n. sp.

Erect shrubs or small trees. Stem nearly 2 dm thick, 8 m high but smaller in the shrub like plants; main branches from the middle in the trees or from below the middle in shrubs, terete; wood moderately hard, yellowish white, radially marked; bark smooth, gray to brown and plumbeus mottled, avellaneus otherwise; branches widely spreading, repeatedly branched from below the middle, the ultimate ones lax and numerous, terete, blackish gray when dry, tough, 5 mm thick, longitudinally wrinkled, the smaller ones brown lenticelled, glabrous but the green and short young tips strigose. Leaves alternate, variable in size, entire, horizontally spreading, flat, membranous, darker brown on the glabrous upper side, glabrate on the lighter brown lower side except the midnerve and veins, elliptic in general outline or oblongish to lanceolate, acute to acuminate at the apex, base obtuse or obtusely rounded, the larger blades 10 cm long by 4.5 cm wide at the widest portion, the smaller ones 2 by 3 cm; midrib caniculate along the upper side, pubescent and prominent on the lower surface, light brown in color on my dry specimen; nerves 5 to 7 on each side of the midrib, also brown and finely pubescent beneath, oblique, cross bars evident on the lower face; petioles up to 5 mm in length, channelled above, rugose and light brown pubescent in the early state.

Inflorescence usually from the distal ends of the short young branchlets, the brief flower bearing stalks alternately scattered and glabrate; flowers yellow to yellowish green and reddish tinged when old; pedicels filiform, 1 cm long, subtended by deciduous pubescent bracts; calyx of 3 short ovate segments; petals clavate toward the base, the inner ones with much broader expansions, dorsally brown pubescent, the inner sides with apical margins finely and yellowish gray ciliate. Fruits pendant, composed of several finger like very dark or dull green pods or carpels, arising from a relatively small receptacle which is borne by a 1.5 cm long and rather stout stalk; the older fruits are 1 dm in length, linear in shape, conspicuously ridged longitudinally, obscurely constricted, the upper segmented portions more or less twisted.

Type specimen numbers 16312 and 14624, discovered by *A. D. E. Elmer* in stony ground of steep wooded inclines of ravines at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, June 1916 and October 1915.

Papualthia irosinensis Elm. n. sp.

A small erect tree or shrub like. Stem 7.5 cm thick, 5 m high, branched from the middle; wood rather hard, dingy white; bark smooth, brownish, melleus except the epidermis; main branches spreading, repeatedly rebranched; the branchlets terete, glabrous, yellowish gray, more or less lenticelled, 3 to 5 cm thick on my dry specimen, the terminal portions thin and slender. Leaves copious, alternately scattered, subchartaceous, horizontal but tips usually recurved, somewhat paler green beneath, glabrous, curing almost equally brown on both sides, entire, narrowly oblong to subelliptic, the larger blades 1 dm long by one third as wide across the middle, sometimes quite a little smaller, gradually tapering into the sharply acute or subacuminate apex, base obtuse or subrounded, ascending; petioles also ascending, comparatively thick and very dark

brown, glabrate, widely grooved along the upper side, 5 mm long or shorter; midrib raised beneath, finely caniculate above, straight; nerves 5 to 7 on each side of the midrib, much less conspicuous beneath, scarcely evident on the upper face, ascendingly curved, reticulations none. Flowers from the upper leaf axils, solitary, far less in number than the leaves, strongly recurved; pedicels at first green, 1.25 cm long, when dry very dark or reddish brown and clothed with short hairs, slender toward the base, gradually thickened toward the distal end; calyx very rigid, disk shaped, thick, united at the base, the 3 blunt segments spreading, 5 to 7 mm across, similar in color and pubescence to that of their pedicels but green in the fresh state; petals of a yellowish gray pubescence when dry, strap like but widest at the base which is more or less thickened and united, 1 cm in length, with blunt apices, quite rigid and cremeus in color. Young fruits 1.5 cm long, glabrate, elongated or ellipsoid.

Type specimen numbers 15884 and 15399, discovered by *A. D. E. Elmer* on very steep wooded slopes of wet stony ground at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916 and November 1915.

Apparently nearest related to *Papualthia bakeri Elm.*, but flowers quite distinct. It was distributed under the genus of *Polyalthia*.

Polyalthia pacifica Elm. n. sp.

A little tree with numerous spreading main branches. Branchlets freely rebranched, terete, glabrous, 5 mm thick, the ultimate ones thin, the young tips appressed pubescent, more or less with ligther colored lenticels. Leaves copious, scattered along all the branchlets, alternate, diverse in size, submembranous, oblong to broadly lanceolate, lucid and darker green on the upper side in the fresh condition,

drying dark brown on both surfaces, entire, our larger blades 8 cm long by 3 cm wide at the middle, apex acute to acuminate, base broadly obtuse to obtusely rounded, subsessile, when young more or less pubescent but soon becoming glabrous, subchartaceous in texture, flat, the smaller ones 2 by 6 cm, sometimes even smaller; midrib brown and very evident from the nether side, plane above, the most prominent ones minutely verrucose on the lower side toward the base; nerves faint, 5 to 7 on each side of the midrib, ascendingly curved, reticulations very faint on the lower leaf face when dry; petioles only a few mm long, leaving scars upon falling. Flowers pendant from the upper leaf axils, solitary; pedicels filiform, varying in length, our longest ones 7.5 cm, not thickened at their distal ends, smooth and glabrous except at the yellowish gray hairy base; calyx composed of 3 free segments which are small, acute or acuminate, early falling, densely yellowish gray pubescent on both sides; petals also 3, not adnate at the base, 1.25 cm long, oblong to broadly lanceolate, obtuse to broadly acute at the apex, base rounded, glabrate on both sides, deciduous, subcoriaceous, yellowish, erect, enclosing a short group of pistils and stamens subtended by a light colored densely pubescent circular base.

Type specimen number 17357, discovered by *A. D. E. Elmer* in dry woods of the mountain range facing the Pacific ocean, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

Leaves similar to *Polyalthia romblonensis Elm.*, but flowers very dissimilar.

Uvaria peninsula Elm. n. sp.

A rambling and scandent shrub or a liana. Twigs on my specimen 5 mm thick, terete, murinus, finely wrinkled longitudinally, more or less provided with flat brown colored lenticels, glabrous even the young apical ends.

Leaves flat, submembranous, when fresh much lighter green beneath, in the dry state pale brown beneath and dark brown above, entire, glabrous on both sides, quite variable in size, elliptic or ovately so, apex short acute, base more or less rounded, larger blades 18 cm long by one half as wide across the middle or below it, the smaller blades 5 by 10 cm, alternatingly scattered along the relatively short branchlets; midrib raised beneath and darker brown below, narrowly grooved along the upper side, the larger ones appearing pulverulent; nerves 7 to 9 on a side, ascendingly curved especially toward their distal ends, brown but much less prominent beneath, smooth, plane on the upper surface, reticulations none or obscure; petioles 1 cm long or less, ascending, widely grooved along the upper side, thick, more or less wrinkled, glabrate, leaving large and light brown circular scars after falling. Infructescence glabrous, solitary from the leaf axils; peduncle terete, 2 cm long, very thick and woody, very dark brown, with lighter brown lenticels; receptacle 2.5 cm across, flatly conical, hard and ligneous, minutely pubescent in between the numerous circular scars of the fallen fruits. Carpels with a single seed, up to 5.5 cm long, subterete, similarly tapering toward both ends, the basal one third stipitate, hard, nearly black on my dried specimen, minutely wrinkled.

Type specimen number 16852, discovered by *A. D. E. Elmer* in the woods of the hills at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

This species is closely related to *Uvaria scandens C. B. Rob.* and *Uvaria zschokkei Elm.*

APOCYNACEAE

Alyxia quadrata Elm. n. sp.

An epiphytic shrub or a liana, associated with other vines. Main stem 12 cm thick, terete, crooked, bend-

able, occasionally branched but chiefly rebranched at the top and forming dense tangles of branchlets bearing leaves; wood porous, soft, the greater central mass yellowish, the outer portion white, comparatively heavy; bark brown, coarsely checked, avellaneus beneath the epidermis; branchlets lax, slender, ascendingly curved, with latex, smooth, glabrous, quadrangular, brown on my specimen though the young parts are green when fresh, 5 mm thick, leaf opposed at the point of branching, the twigs are relatively short. Leaves scattered in whorls of 4, flat and entire, ascending, rigidly coriaceous, tips only slightly recurved, glabrous, edges minutely involute in the dry state, lucid on the upper surface, much paler green beneath, drying unequally brown, obovately oblong or subelliptic, apex short and terminated by a blunt point, base acuminate or cuneate, varying from 3.5 to 7 cm in length without the petiole, from 1.5 to 3.5 cm wide above the middle; midrib stout, raised on the lower side, deeply caniculate along the upper surface, also brown; lateral nerves obscure but more evident on the upper side of my dry specimen, divaricate, parallel, numerous, straight; petioles 1 cm long, glabrous, grooved along the upper side, usually somewhat thickened toward or at the base, leaving nodal scar vestiges after falling. Cymes upon short recurved axillary peduncles from 5 to 8 mm in length and which become very short branched at the top; flowers small and numerous, bract subtended, sessile or upon short and more or less puberulent pedicels; calyx persistent, very short, its segments sharply pointed, turning grayish white when old; corolla brownish except the green base, tubular, the constricted apical portion cremeus, 1 cm long before opening. Young fruits in spreading clusters, moniliform, from 1 to 4 cm long, sometimes branched, glabrous except the minutely pubescent pedicels.

Type specimen number 15827, discovered by *A. D. E. Elmer* climbing along large tree trunks of humid forests

at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916.

Of the numerous specimens of *Alyxia monilifera Vid.* in the Bureau of Science herbarium with three leaves to a whorl, there are only two or three on the quadrate plan. Our specimen is most critically related to *Alyxia confertiflora Merr.*

Kibatalia fragrans Elm. n. sp.

Medium sized trees. Trunk 6 dm in diameter, subterete, 10 m high or higher, chiefly branched from above the middle; wood moderately soft, white, odorless and tasteless, excellent for cutting purposes; bark smoothish, grayish white, brown below the epidermis, checked and with latex; main branches widely spreading, numerously and laxly rebranched; twigs slender, terete, glabrous, curved, nearly black on my specimen. Leaves copious, oppositely scattered along the branchlets, coriaceous, lucid on the upper darker green surface, flat, glabrous, curing lighter brown beneath, lanceolate to narrowly oblong, 3 cm wide at the middle, 8 cm long without the petioles, the lanceolate ones much smaller in size, base cuneate, gradually tapering to the blunt tip, occasionally rounded or acuminate, my dry leaves are more or less grayish white blotched, edges entire; midrib straight, raised beneath, deeply channelled along the upper side, brown, smooth and glabrous; lateral nerves very obscure, about 5 on each side of the midrib, ascendingly curved especially toward their distal ends, reticulations not evident; petiole 5 mm long more or less, brown when dry, rather thin, glabrous, grooved along the upper side. Flowers in small groups, either terminal or from the uppermost leaf axils, usually suberect, green, glabrous; peduncles very short, bearing few to several flowers from their ends, stout; pedicels thin, 2 cm long, also glabrous, alternatingly arising from the peduncle,

apparently subtended by small apiculate bracts, leaving large grayish white and circular scars upon falling, slightly thickened toward both ends; calyx persistent, fleshy, glabrous, less than 5 mm in length, the 5 sepals ovate in outline; corolla easily falling, fragrant, 3 cm long, the basal one half tubular, the upper one half 5-segmented; tube glabrous, gradually expanded toward the base, abruptly so toward the segmented portion, glabrous on the exterior; lobes also glabrous except at the throat and middle basal portion of the upper side, 1.5 cm long, obovately oblong, widely spreading and more or less recurved toward their distal ends, cremeus in color. Fruit pendant from stout woody stalks, subterete and dividing into halves, greenish, glabrous, 2 dm long, ligneous, linear but more tapering toward the base than toward the abrupt apex; coma of the numerous minute seeds dirty yellowish white.

Type specimen numbers 15934 and 15270, discovered by *A. D. E. Elmer* in damp loose soil of steep forested ravines at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May 1916 and November 1916.

Quite distinct from *Kickxia macgregorii Elm.* My specimens were distributed under the genus of *Kickxia.*

Parsonsia aterinervia Elm. n. sp.

A shrubby climbing vine or liana. Branches curved, twisted, subterete or slightly compressed, glabrous, roughened with numerous small excrescences, light brown on my dry specimen, about 5 mm thick or wide. Leaves opposite, glabrous, coriaceous, ascending, well scattered along the branchlets, flat, darker green on the upper side and darker brown when dry, entire, terminated into a short but sharply acute apex, base truncately rounded, elliptic, 7.5 cm wide across the middle, twice as long without the petioles, sometimes a little smaller in size; midrib stout beneath, glabrous and smooth, ater or darker brown

on the lower leaf surface, minutely sunken on the upper side; nerves 5 to 7 on a side, ascendingly curved, also ater in color on the lower face when dry, rather conspicuously so, entirely smooth and glabrous, the secondary nerves and cross bars relatively conspicuous beneath; petioles 2 to 3 cm long, ascendingly curved from the base, shallowly grooved along the upper side, the edges frequently ciliate, the lower side often becoming crustaceous. Infructescence subpendant from the leaf axils, 15 cm long, stout and subligneous as the branchlets; peduncle 10 cm long, few branched from above the middle or toward the top; branches 3, averaging 5 cm in length, thinner than the peduncle, more or less angular, subpendant, bearing a few hanging pods towards their distal ends; pedicels 1.5 cm long or shorter, thick, longitudinally ridged or angular, thickened at the top, alternating along the upper portion of the branchlets. Pods or capsules 15 cm long, fluted longitudinally, subterete or irregularly compressed, linear, long pointed at the apex, dark green when fresh; the very linear seeds 1 cm long, the dull silky white coma three to four times as long.

Type specimen number 15707, discovered by *A. D. E. Elmer* in the vicinity of Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916.

Evidently its relationship is with *Parsonsia confusa Merr.*, but not with *Parsonsia magnifolia Elm.*

Parsonsia urdanetensis Elm. n. sp.

A rambling woody vine. Stem greenish, terete, 1 cm thick, rather long, here and there branched; the branches also terete, more or less curved and twisted, 5 mm thick, obscurely ridged longitudinally, tough, covered with a dense but short pubescence, dirty brown when dry. Leaves widely scattered, horizontal or descending, deep green above, much lighter beneath, nearly flat, entire,

submembranous, elliptically oblong, terminating into a very short but distinct and finely pointed apex, puberulent on both surfaces, curing equally dark brown on both sides, obtuse to broadly cuneate at the base, 3 in a whorl, the larger blades 5 cm wide at the middle, twice as long without the petioles, my smallest blades are 5 cm long and one half as wide; midrib grooved along the upper side and densely pubescent, more conspicuous and darker brown beneath, sparsely pubescent along the lower side; nerves 5 to 7 on each side of the midnerve, comparatively faint yet evident from the upper face, ascendingly curved toward their distal ends, similar in color, also puberulent on both leaf sides, reticulations fine, plainer on the lower face; petioles 1.5 to 3 cm in length, slender, dark brown and similarly pubescent, shallowly caniculate along their upper sides, expanded at the base. Cymes terminal, 6.5 cm long on my specimen, ascending, usually subtended by small leaves, branched toward the top; peduncles 3 to 8 cm long, quite slender, dark brown and similarly pubescent; primary branches up to 10 mm long but sometimes much shorter, straight, ascending or more spreading, lighter brown hirsute, subtended by short and apiculate persistent hirsute bracts; pedicels strict, subumbellately clustered, the average ones equalling the branches in length or longer, also bract subtended and similar in pubescence; calyx about 3 cm long, united at the base, puberulent, the acute to acuminate segments erect, green when fresh; corolla twice as long, yellow, glabrate, the segments slenderly pointed, odorless. Fruit pendant, rigid, also green, subterete or compressed, up to 25 cm long, minutely fluted longitudinally, puberulent, linear, gradually and slenderly pointed, upon a 10 to 15 cm long stalk; coma of the very slender seeds dull yellowish white.

Type specimen number 13836, discovered by *A. D. E. Elmer* in a very wet rather open gulch surrounded by dense forests encircling a lagoon at 5250 feet altitude,

Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September 1912.

Related to *Parsonsia philippinensis Merr.*

Wrightia sorsogonensis Elm. n. sp.

A woody branched shrub. Branches spreading, freely rebranched; branchlets terete, lax, smooth, glabrous, reddish dark brown, sparsely sprinkled with small and circular light colored lenticels. Leaves opposite, many, well scattered along the branchlets, horizontal or descending, the younger ones ascending, entire, occasionally a trifle wavy, membranous, curing brown above but more yellowish brown beneath, base obtuse on most of them, abruptly terminating into a sharply acuminate apex, the larger blades 4.5 cm wide at the middle or its widest portion, 12 cm long without the petiole, oblong, the terminal pair usually much smaller and lanceolate, the lower blades often also smaller but ovate to ovately elliptic in shape; midrib sometimes dividing the larger blades into two slightly unequal sides, conspicuous and reddish brown beneath, sunken along the upper side, smooth and glabrous; nerves 5 to 7 on each side of the midrib, similar in color, divaricate at the base but their apical ends strongly arching over and connecting with the upper nerves, reticulations very evident on the lower surface in the dry state; petioles up to 1 cm long, glabrous, smooth, brown, grooved above. Inflorescence cymosely paniculate, terminal, 5 to 10 cm long, almost as wide, ascending; peduncle from 2 to 5 cm long, terete, dull brown, sparsely lenticelled, glabrate, commonly subtended by a pair of small leaves or even by normally sized leaves; main branches of inflorescence divaricate, binately rebranched from the middle or below this, puberulent or subvelvety short pubescent, subtended by linear to lanceolate bracts, the ultimate branches also subtended by similar bracts and they themselves provided with per-

sistent but smaller sized bracts; pedicels very slender, 5 to 8 mm in length, subtended by short and blunt bracteoles, all cinereous; calyx united at the base, bluntly 5-tooth, also cinereous, 3 mm high and nearly as wide across the top; corolla bud 12 cm long, erect, ovately linear to narrowly oblong in shape, terete, constricted at the base, apex bluntly rounded, finally divided into 5 oblong segments, grayish puberulent or cinereous; stamens erect, light in color, the anthers sharply pointed and more or less ciliate.

Type specimen number 15595, discovered by *A. D. E. Elmer* in the woods of hills at low altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

The inflorescence on our specimen is distinct from *Wrightia calycina A. DC.*

ARACEAE

Alocasia urdanetensis Elm. n. sp.

A succulent perennial herb. Stem with rhizome erect, 1.5 cm thick, terete, 5 or more cm long, yellowish when dry, bearing slender lateral more or less fleshy pubescent roots. Leaves basal, clustered, three on my specimen, chiefly erect but the outer or older ones subhorizontally spreading, entirely glabrous, 4 dm long with their stalks, at the base copiously provided with brown membranous bracts; petioles 2 dm long or longer, curved, smooth, glabrous, also terete, ascending, herbaceous, reddish tinged, curing dark yellowish brown, narrowly linear from the base of the leaf blade down toward the widely expanded base; bracts broad, very thin at least in the dry tobacco brown state, persistent, minutely striate longitudinally, imbricately clasping, narrowly oblong, from 5 to 8 cm long on my type specimen; broadened petiole bases 5 cm long, gradually becoming dilated toward the base and membranous, broadly clasping the rhizome or caudex at the

base, with numerous longitudinal striae, on the exterior with minute chalky white spots, otherwise tobacco brown; laminae minutely involute, 25 cm long, averaging 7 cm wide toward the base, ascending or horizontal, flat except the recurved apex, quite rigid, very deep green or velvety green above, pale or subglaucous green beneath, distinctly sagittate at the base, the widest portion at the base, the elongated or triangularly elongated lobes 7 cm long and extending straight downwardly, the side margins coarsely wavy or obscurely undulate with the broad triangular sinus entire, beneath curing light cremeus, above nearly melleus, gradually tapering from the base to the strictly straight and sharply acuminate tip, the distal ends of the lobes subauriculately rounded; midrib lilacinus, straight from base into the apex, conspicuous beneath toward the base, plane or only narrowly grooved on the upper surface; lateral nerves also lilac tinged, 5 to 7 but sometimes with a few intermediary ones, ascending except the basal ones which extend downward into the lobes, coarsely branched, their tips uniting with a submarginal line, reticulations absent. Fruiting heads few, central, strict, arising from the leaf axils, encased by the sheaths and surrounded by the clasping leaf bases; peduncles very slender, terete, also reddish tinged, turning dull yellow when dry, 3 to 4 dm long or equalling the foliage, slightly thickened toward the top, curved or wand like, rather smooth and glabrous; spathe on our specimen old, short barrel shaped, 3 cm long by one half as thick across the middle, very thick or leathery, minutely striate longitudinally, its reddish brown spots scarcely evident, the sides overlapping, apex more acute than the obtuse base, the thick and persistent portion of the spathe terminated by a membranously brown colored flap or appendage which early withers and becomes detached; spadix well encased by the greenish and stout spathe.

Type specimen number 13857, discovered by *A. D. E. Elmer* in wet compact humus covered soil of a steep jungle or wooded slope of Cawilanan creek at 4500 feet altitude, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September 1912.

Merrill's Atimonan and *Foxworthy's* mount Abu specimens are exactly *Alocasia heterophylla* (*Presl*) *Merr.*, under which name my specimens were distributed, but from which our type specimen can very readily be distinguished.

Schismatoglottis hastata Elm. n. sp.

Herbaceous and terrestrial, growing in small individual clusters. Corms erect, 2 to 3 cm long, one third as thick, bearing a profusion of long fleshy roots. Leaves few to severally clustered, minutely blistery on the upper surface, all radical, suberect, ascending or subrecurved, 10 to 15 cm long with their stalks, the smallest ones scarcely more than 5 cm in length, entirely glabrous, submembranous or rather thin in the dry state; laminae diverse in size, the larger ones 12 cm long by nearly 5 cm wide across the middle or below it, the smaller blades are half as long by one half as wide, in the fresh state velvety dark green on the upper side except for the grayish white zone extending from the base through the middle portion of each half blade clear into the apex, the green portion olivaceus colored when dry, beneath much lighter green in the fresh plants, curing grayish green, all are curved more or less especially so toward the acute to acuminate apex which is usually somewhat turned to one side, sometimes the blades appear a trifle inequilateral, the base quite deeply hastate or sagittately hastate, the sinus proportionately deep and narrow, the lobes rounded, occasionally assuming an auriculate shape, the general shape of all the leaves, both small and large, is oblong to ovately oblong rather than broadly lance or sagittate in shape; petioles

slender, also glabrous, about as long as the blades or more often longer, on my specimen ground colored, gradually dilated toward the base where they are alternatingly clasping one another, in the early state enveloped by a thin light brown colored sheath or bract, usually a little compressed or flattened and impressed along the upper side; midrib more conspicuous and brown beneath, becoming faint toward the usually curved apex; lateral nerves divaricate, many, much ascendingly curved toward their distal ends, comparatively rather faint, brown, crowded toward the base where a couple of pairs run into the lobes on each side of the midrib. Inflorescence arising from the leaf axils; peduncles 3 to 5 cm long, gradually thickening toward their distal ends, shorter than the petioles but otherwise very similar, ascending from the base but when old becoming recurved, their bases very thin and dirty brown; sheaths minutely striate, obscurely sprinkled with reddish brown dots or spots, otherwise glabrate; flowering spathe irregularly club shaped and unsymmetric at the base, truncately ruptured across the top, minutely pulverulent and minutely reddish brown spotted; floral parts also faintly spotted.

Type specimen number 17828, discovered by *A. D. E. Elmer* on cliffs near the summit region, Los Banos (Mt. Maquiling), Province of Laguna, Luzon, July 1917.

Years ago it was distributed as *Schismatoglottis minor Elm.*, but that specific name is untenable, so it is here published under another name. Our type is nearest related to my number 13489 from Cabadbaran of Agusan province, which however is a pretty close match to *Schismatoglottis mindanaoana Engler.*

Scindapsus fragilis Elm. n. sp.

A small scandent and suffrutescent shrub. Stem twining and tightly attached to its host tree, 1.5 cm across, from

5 to 8 m high, somewhat compressed, sharply crooked at intervals where new short lateral branchlets are formed, flexible, numerously branched especially toward the top where they form tangled masses, regularly ringed with old leaf scars; woody tissues whitish, the central mass or pith yellow, covered with yellowish brown bark or epidermis; branchlets glabrous, short, glaucous green, fragile or easily breaking at the joints, descending or the free ends drooping and with ascendingly curved tips, curing grayish black or dull olivaceus, the dry twigs less than 5 mm in diameter. Leaves descending, leathery, dark or velvety green above, much lighter green on the lower side, flat but tips strongly recurved when fresh, when dry dark brown above and light brown beneath, glabrous but the nether side densely sprinkled with lighter brown or grayish cystoliths, entire, primarily lanceolate or the smaller laminae ovately elongated, the average blades 15 cm long by 3.5 cm wide across the middle or below this in the smaller ones, gradually tapering to the acuminate apex which is usually turned a trifle to one side, the basal portion slightly narrowed and bluntly terminated or broadly rounded in the smaller leaves, the larger ones merely obtuse and frequently a little inequilateral, the basal end never cordate; midrib ridged and blackish brown beneath when dry, straight or only the tip curved a trifle into the sharp apex, flat above or depressed toward the base; nerves numerous, parallel, obscure or faint from both surfaces, oblique, all equally obscure or faint, no submarginal lines evident; petioles ascending, from 2 to 4 cm in length, most of them 3 cm, strict, glabrous, rather stout and reinforced along the upper side the full length with winged edges which form a gutter to the base, partly clasping the branchlet, persistent to the blades, becoming detached at the base and leaving conspicuous scars. Spike terminal, solitary, upon green suberect stalks, cylindric, nearly 5 cm long by 1.5 cm thick

but considerably smaller on my dry specimen; peduncles about as long, subterete, slightly enlarged at the base, glabrous, longitudinally striate, ascendingly curved toward the distal end, with a broad and oblique yellowish gray to brown band or spathe scar encircling it from 5 to 8 mm below the basal portion of the spadix; cob or floral spike terete, dull yellowish to brown when cured, 1.25 cm thick, 4 cm long, in the fresh state chalky white; florets densely crowded clear around and for the full length, seemingly inserted upon a pubescent receptacle, the greater or contiguous portion angularly compressed and curing lighter in color, at the base becoming lacerated and detached, the encrusted apex irregularly or angularly circular, the marginal portion radially striate, the circular or stigmatic part darker brown and a trifle raised.

Type specimen number 13658, discovered by *A. D. E. Elmer* in gravelly ground of woody jungles along the Catangan creek at 750 feet altitude, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August 1912.

ARALIACEAE

Schefflera todayensis Elm. n. sp.

Scandent shrub upon trees. Stem 3 to 5 cm thick, terete, smooth, greenish gray and only sparingly lenticelled; wood whitish, with a large green pith, strongly araliaceous in odor and sweet to taste; branches few, the ultimate ones rather long; twigs terete, glabrous. Leaves scattered along the branchlets, heavy, thickly coriaceous, 9 to 11-foliolate; petioles 15 cm long or much longer, green and smooth, brownish when dry, terete, expanded at the base into a thick gray colored bifid plate 1.5 cm across; petiolules similar in shape and color to the petiole but much thinner, straight, widely and radially spreading, also glabrous, 3 to 5 cm long, slightly crooked at their distal ends, easily separating from the base while

curing; blades horizontally spreading or only their tips recurved, otherwise flat, entire, base obtusely rounded or rounded, apex abruptly terminating into a short acute point, deeper green above, drying similarly dirty or yellowish brown, oblong for the larger ones, subelliptic for the shorter ones, 10 to 20 cm in length, 5 to 7 cm wide at the widest portion; midrib raised beneath, sunken on the upper surface, straight from base to apex yet occasionally somewhat curved; nerves conspicuous beneath, divaricate, their tips archingly united, the upper ones ascendingly curved; reticulations quite evident especially upon the upper surface in the dry state, rather fine. Infructescence showy, crowded from the ends of the long half drooping branchlets, with 7 to 11 spikes; peduncles about one third the length of the spikes, the longest being nearly 1 m in length, sometimes much shorter, each subtended by a 5 cm long greenish bract, radially spreading either horizontally or ascendingly, the longer ones recurved and drooping; rachis slender, glabrous, green, more or less angular; flowers and fruits in alternating clusters along the rachis, upon distinct yellowish colored and secondary peduncles 3 to 5 mm in length. Fruiting pedicels shorter, glabrate, strict, filiform, umbellately spreading, yellowish, persistent; berries subglobose, less than 7 mm in diameter, light yellow, brown on my dry specimen and strongly 5-carinate.

Type specimen number 10937, discovered by *A. D. E. Elmer* climbing forest trees of a ravine along the Baracatan creek at 1750 feet altitude, Todaya (Mt. Apo), District of Davao, Mindanao, June 1909.

My specimens were distributed as *Schefflera longifructescens Elm.*, from which our new species really differs in its leaves, distinct secondary peduncles and much shorter pedicels.

BEGONIACEAE

Begonia bakeri Elm. n. sp.

Herbs and terrestrial. Stems succulent, green or reddish tinged, creeping, occasionally branched, leaf bearing toward their ends, coarsely wrinkled and deeply grooved longitudinally in the dry state, glabrous; roots fibrous, scattered along the lower side of the stem and branches. Leaves alternately crowded, flat, subcoriaceous, 1 to 2.5 dm long; petioles ascending or more widely spreading, succulent, pale green but very dark brown when dry, densely reddish brown hirsute or only sparsely so, rather slender, frequently curved, from 3 cm to 15 cm in length, attached to a protuberance along the upper side of the stem or rhizome, subtended by bracts; these bracts are caducous. ovately lanceolate, about 2 cm long, folded upon the upper side, acuminately pointed, glabrate except at the ciliate apex, dull brown; blades obliquely cordate and ovate in general outline, the smaller ones 3 by 4 cm, the larger ones 12 cm long by 7.5 cm wide, margins irregularly and minutely toothed, occasionally with a blunt lobulate point on the upper side and a trifle above the middle, with a deep sinus at the base, the apical portion gradually tapering to the acuminate apex, the basal sides rounded especially the lower side, much paler beneath even in the dry brown state, sparsely ciliate on both surfaces when old, the nether side covered with small circular scales which on my specimen are grayish white; nerves 6 to 9, all radiating from the base, more evident from the lower side and darker brown in color, the larger or longer ones branched, the branches ascending, reticulations none. Peduncles arising from the leaf axils, erect or suberect, very slender, sparsely ciliate, equalling the leaves in length, few branched toward the top; branches divaricately rebranched, filiform but usually thickened at the point of branching; pedicels also filiform and divaricately spreading as the

branchlets, smooth and glabrous; flowers from 1 to 3, pendant upon short or longer pedicels, subpendant, odorless, white or reddish blotched on the dorsal side of the thin petals which are from 5 to 8 mm in length and very unequal in size. Capsules glabrous, also pendant, greenish, light brown when dry, 1.25 cm high, 2.25 cm wide across the truncate top, broadly rounded at the base, their wings very unequal, bluntly pointed at the upper and outer portion.

Type specimen number 14597, discovered by *A. D. E. Elmer* upon north ledges of woods at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

Apparently nearest related to *Begonia copelandii Merr.* Named after the late *Charles Fuller Baker.*

Begonia purpurea Elm. n. sp.

Succulent herbs. Stems few to several from the same root, creeping in all directions, the larger ones a m long, crooked, occasionally branched toward the base, terete, slender, 5 mm thick or thicker, purpureus at the joints, sparsely ciliate, longitudinally striate when dry and brown; roots arising mainly from the nodes, fibrous. Leaves also arising from the joints or nodes, ascending, not numerous, widely scattered; petioles strict, erect, quite slender, thinner than the stems but similar in color when dry, sparingly strigose, 1.5 to 2 dm in length or shorter, at the base subtended by brown colored and ciliate bracts; blades horizontal or descending, nearly flat, very dull green and shining above, beneath exactly purpureus throughout of both the young and old blades, curing brown on both sides except for the metallic luster on the lower side, glabrous, minutely grayish white scale dotted on the lower surface, margins entire or here and there with obscure apiculations and in the younger state ciliate, with a deep sinus, our

largest blades 12 cm long and 7 cm wide across the middle, ovate in general outline, very obliquely cordate, the basal ends broadly rounded especially the lower or outer side, gradually terminating into a very sharply acuminate point; nerves 5 to 7, all radiating from the base, dark brown and more conspicuous beneath, more or less finely pubescent along the lower side, the larger nerves 2 to 3 rebranched, the branches ascending, reticulations none. Peduncle scape like, as slender as the petioles and usually exceeding them in length, erect or nearly so, sparsely ciliate, binately branched toward the top, arising from the leaf axils, not numerous and sometimes solitary; branchlets glabrous, green, thickened at the point of branching, 1 to 3 cm long, ascending, filiform, few rebranched; pedicels short; calyx greenish, small; petals thin, white but pink in the unopened flowers, broadly oblong or subelliptic, 1 cm long and with a distinct stipe.

Type specimen number 16565, discovered by *A. D. E. Elmer* upon ledges of humid woods at 750 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July 1916.

Begonia sorsogonensis Elm. n. sp.

Coarse herbaceous and terrestrial plants. Stem 1 m high, occasionally a few from the same root cluster, usually branched from above the middle, at the base quite rigid and 1.25 cm thick; branchlets pale green, murinus when dry, subterete, longitudinally grooved, glabrous, ascending, reddish at the nodes, subtended by 1 cm long and brown colored bracts, the ultimate ones slender. Leaves alternately scattered toward the ends of the branchlets, chiefly ascending, subcoriaceous, shining above, much paler green beneath, flat and light brown beneath, glabrous, the lower surface finely covered with minutely grayish white and circular scales, oblong in general outline or broadly lanceolate to subelliptic, inequilateral, the side nearest the

branch straight, the outer side curved, irregularly and coarsely dentate from above the middle, terminating into a very slender and apiculate point, basal portion subentire especially along the straight edge, broadly obtuse to obtusely rounded at the abrupt base, the average blades 3 cm wide across the middle or a little above this, 10 cm long without the petiole; nerves reddish in the fresh condition, drying very dark brown beneath, 3 to 5 from near the base, the midvein most prominent and extending from the petiole into the apex, usually once or twice rebranched, the branches and lateral nerves very obliquely ascending; petiole 1 cm long or shorter, glabrous, subtended by fugacious and membranous bracts 1.25 cm in length. Inflorescence from the uppermost leaf axils or leaf opposed, 5 to 8 cm long, erect or nearly so, binately and numerously branched from the middle; peduncle as well as the branchlets glabrous and rather thin, the latter subtended by minute bracts or bract vestiges; the ovately orbicular flowers staminate and pink to white; pistillate flowers few or solitary from the axils between the leaf and the pedunculate stalk. Capsules upon 1 cm long and recurved pedicels, 2 cm long, fully as wide across the truncate apex, base broadly rounded; wings chartaceous, pale green but light gray when dry.

Type specimen number 14515, discovered by *A. D. E. Elmer* in wet or soggy ground of dense woody depressions at 2500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

Its relationship is with *Begonia contracta Warb.* and *Begonia palawanensis Merr.*

BIGNONIACEAE

Radermachera punctata Elm. n. sp.

An erect medium sized tree or smaller. Trunk 3 to 5 dm in diameter, 12 m high, branched from the middle

or chiefly toward the top, subterete; wood hard, whitish but reddish brown toward the center; bark thick, dark brown, longitudinally checked and scaling in small plates; main branches ascending, ultimately numerously rebranched; twigs mostly ascending, avellaneus, green when fresh, black when dry, glabrous, covered with light colored lenticels. Leaves horizontal or the younger ones ascending, heavy, glabrous, oppositely scattered along the branchlets, pinnate or bipinnate and apparently imparipinnate, averaging 3 dm in length but quite variable in size; petiole one third the length of the entire leaf more or less, terete, black on my specimen, slightly thickened toward the lenticelled base, otherwise smooth; secondary petioles ascending and widely spreading, much thinner or rather slender, variable in length, glabrous and also black, easily separating, much shorter, deeply caniculate along the upper side, the ultimate ones appearing minutely punctate; leaflets opposite, minutely punctate beneath, curvingly folded upon the upper face and with recurved tips, coriaceous, deciduous, entire, paler green beneath, drying similarly blackish brown on both sides, sublucid on the upper surface, lanceolately oblong, with a sharp and slenderly acuminate apex, base narrowly acute, our largest leaflets 1 dm long and one third as wide across the middle, the smaller ones much narrower; midrib black, quite evident beneath, sunken on the upper surface; nerves faint, 7 to 10 on each side, ascending, reticulations obscure; petiolule persistent to the leaflets, from 1 to 3 cm in length, glabrous, black, caniculate along the upper side. Inflorescence equalling the foliage or longer, terminal, suberect, paniculately branched, green, turning nearly black when dry; branches scattered, opposite, much ascending, glabrate or minutely punctate, either compressed or angular toward their distal ends where they bear a cluster of flowers; pedicels mostly persistent, finely puberulent, 1 cm long, atropurpureus, buds of the same color; calyx

tapering toward the base, 1.25 cm long, fully as wide across the bi or trilobed top; corolla 4 cm long, constricted at the base, usually recurved and oblique across the inflated throat; lobes broadly rounded, short, reflexed, white to pink, aurantiacus on the interior.

Type specimen numbers 16066 and 14817, discovered by *A. D. E. Elmer* in compact ground along a wooded stream bank at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915 and May 1916.

Radermachera elmeri fragrans Elm., but with shorter calyx, longer and wider corolla and with punctate leaflets.

BURSERACEAE

Canarium antonii Elm. n. sp.

A small and slender tree like shrub. Stem up to 12 cm thick and 7 m high, with branches mainly toward the top; wood white or yellowish white, with a strong canarium odor, soft and pithy in the center; bark smooth, yellowish gray to brown, with small excrescences, latericius beneath the epidermis; main branches few, ascending, slenderly elongated. Leaves alternatingly crowded toward the ends of the stem and branchlets which are dark green and at least 2.5 cm thick, divaricate, horizontally spreading, imparipinnate, a meter long more or less; petiole terete, smooth and glabrous, chestnut brown on my specimen, about one third the length of the entire leaf, 1 cm thick, stout, strict, flattened on the upper side toward the much enlarged base; rachis very similar but thinner, very slender toward its distal end; leaflets slightly inequilateral below the middle, similarly spreading or more descending, shallowly folded upon the upper darker green and shinning

surface, 15 in number to a leaf, subchartaceous, glabrous on both sides, slightly unequal brown or castaneus beneath, entire, often recurved at the abrupt sharply acute to acuminate apex, base cuneate to broadly obtuse and usually a trifle unequal, our lateral or larger leaflets 10 cm wide at the middle, 25 cm long without the petiolule, opposite or widely scattered, the few small interposed leaflets 4.5 by 8 cm and obovately elliptic; petiolule ascending, strict, 2 to 5 cm long, at right angle to the rachis, thickened at the base, the terminal one longer; midrib ridged especially beneath; nerves 6 to 10 on each side, tips ascendingly curved, cross bars with reticulations present. Panicle green, axillary, strongly aromatic, seldom lateral, gracefully recurved, nearly as long as the foliage, its branches lax and slender; branchlets in pairs from their distal ends, at right angles, subtended by short but sharply pointed bracts; flowers few clustered from the ends of the ultimate branches which bear the persistent bracts; pedicels 5 mm long, filiform, bract subtended; calyx red on the exposed sides, otherwise green, turbinate, broadly toothed; corolla nearly twice as long in anthesis, glabrous on the exterior, flesh red. Drupes shining, 4 cm long, shorter when dry, 15 mm in diameter, angularly terete, the apical portion strongly crooked when dry, exactly purpureus even the young ones. The subpendant fruits are very showy!

Type specimen numbers 16133 and 15823, discovered by *A. D. E. Elmer* in damp humus covered ground of densely forested flats at 1250 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May and April 1916.

A much larger plant in all respects than 795 *Cuming*, the type of *Canarium gracile Engler*. My last number cited appears to be this same species. Named after our son *Anton D. Elmer, M.D.*

Canarium longiflorescens Elm. n. sp.

Tree, 10 to 15 m tall. Trunk 2 dm in diameter, terete, chiefly branched toward the top or from above the middle, branches widely spreading, not numerously rebranched; wood white or nearly so, moderately hard and nice to cut, rather light, odorless and tasteless; bark smooth, more or less mottled, brown beneath the epidermis; twigs 3 to 7 cm thick, reddish brown, the leaf bearing portion green and glabrous. Leaves crowded toward the ends of the branchlets, ascendingly spreading or horizontal, 6 to 10 dm in length; petiole yellowish green when fresh, triangularly flattened, thickened at or toward the base, one third the length of the entire leaf, stout; rachis also stout, subterete, reddish brown or nearly black when dry, becoming glabrate, horizontally fluted or ridged; petiolules relatively thick especially toward the base, 5 mm long or shorter, on some leaflets nearly obsolete, puberulent; leaflets 9 to 12 pairs, thinly coriaceous or subchartaceous, entire, conduplicate upon the upper sublucid richer green surface, oppositely well scattered, the basal pairs much reduced, castaneus beneath, glabrous above, puberulent beneath. the average blades 2 dm long by 7 to 10 cm wide below the middle, sometimes widest across the base, gradually tapering or rounded toward the short acuminate point, base broadly rounded and shallowly cordate, usually a trifle inequilateral at the base, oblong or the lower ones ovately oblong; midrib keeled beneath, often a trifle curved, also puberulent along the upper surface; nerves 22 on a side, raised and puberulent beneath, divaricate, parallel, only their tips strongly arched, cross bars faint beneath, reticulations quite evident on the upper face. Inflorescence ascending from the uppermost leaf axils, equalling the foliage in length, sparingly rebranched from the middle, the central stalk usually much elongated, the rachis and especially the branchlets short pubescent; flowers

clustered from the distal ends of the lower much ascending branches or clustered upon very short scattered branches along the elongated terminal stalks; pedicels 5 mm long, soft pubescent; calyx turbinate, short, similarly pubescent, green as its pedicel but turning reddish brown when dry; corolla in the bud state 1 cm long, narrowly oblong, light gray velvety, cremeus; stamens yellowish brown; ovary deep orange red.

Type specimen numbers 10817, 11069 and 12015, discovered by *A. D. E. Elmer* in the forests ranging from 1500 to 3000 feet altitude, Todaya (Mt. Apo), District of Davao, Mindanao, June to July 1909.

It is neither *Canarium nervosum Elm.* nor *Canarium costulatum Elm.* Likewise, it is also related to a number of other Philippine species of *Canarium.*

COMMELINACEAE

Cyanotis brunnea Elm. n. sp.

Herbaceous and forming mats. Stems various in length, glabrous, light brown in the dry condition, their ground portion prostrate, very slender or filiform, appearing compressed and somewhat twisted when dry, repeatedly branched from the ground and up, the upper portions suberect; rootlets fibrous, arising from the nodules or joints. Leaves horizontally spreading, flat, glabrous, solitary or in opposite pairs, well scattered along the stems and branches, greenish on the lower side and brown or brunneus on the upper side when dry, entire, sessile, exceedingly variable in size, normally linearly lanceolate, gradually tapering to the acute to obtuse apex, base broadly attached to the ligule, very thin in texture, 1.5 cm long by 5 mm wide at or below the middle, some leaves are very small and appear as bracts, occasionally they are ovately elliptic in shape; nerves usually 3 but with faint

intervening ones, parallel or extending from the base to the apex; nodal sheaths or ligules saccate, about 5 mm long or much shorter, loosely enclosing the stalks, light brown on our specimen, truncate but often oblique at the apex and provided with long whitish colored hairs which seem to disappear on the withered old ones. Flowers or fruits solitary or few clustered from the ends of the longer more or less erect stems and branches, subtended by a pair of unequal leaves which are more ovate in shape than the other leaves; the inner foliaceous leaves much smaller, all glabrate or with scattered ciliae along their basal edges; ovary hirsute, the capsule glabrous when old.

Type specimen number 18181, discovered by *A. D. E. Elmer* in woodlands, Los Banos (Mt. Maquiling), Province of Laguna, Luzon, July 1917.

Related to *Cyanotis moluccana (Roxb.) Merr.*, but our leaves are smaller and much narrower, in fact linearly lanceolate. My number 18178 seems to be more nearly *Cyanotis capitata (Blm.) Clarke* than to my type number.

COMPOSITAE

Gynura labiensis Elm. n. sp.

Perennial and herbaceous plants. Stems few to several from the same root tussock, dull brown when dry, erect, generally terete but conspicuously ridged and fluted longitudinally, more or less purplish, up to 6 dm high, flowering branches from below the middle, puberulent. Leaves basal, puberulent or pubescent, leathery, ascending or widely spreading, much paler green beneath or purplish on the lower side in the middle region, 2 dm in length by 6 cm wide above the middle, much larger in the fresh state, frequently smaller, margins coarsely serrate or dentate, the obtuse to attenuate base subentire, apex obtuse to sub-

acute, curing lighter brown beneath, flat, obovately oblong to obovately elliptic for the smaller ones, oppositely or subalternately crowded from near the base of the stem; midrib stout toward the base, faint toward the apex, pubescent along both sides, beneath usually purple especially toward the base; nerves 5 to 7 on each side, relatively faint, much ascending but only slightly curved, finely pubescent; petiole 1 to 2 cm long, flattened toward the base, pubescent, at the distal end gradually extended into the leaf blade; bracts axillary or interaxillary, caducous, 1 cm long, ovately elliptic, soft pubescent. Inflorescence terminal, rather compact, peduncle widely scattered from near the base or from the base, alternate, much ascending, the lower ones 2 dm long, the terminal ones much shorter. usually pubescent especially toward the flower bearing portion, subtended by sessile foliage bracts of diverse sizes; branches light gray pubescent, erect or ascending, subtended by variously sized subpersistent and green colored incised bracts; pedicels with the ultimate branchlets subtended by linear and entire bracteoles; flowering heads with yellow and red florets, subtended by narrowly linear green bracteoles along the 5 to 15 mm long pedicels; flowers numerous, 2 cm long when dry but much longer when fresh, surrounded by an involucre shorter in length; involucral bracts erect, linear, setaceously pointed, strigose on the exterior, greenish. Pappus copious, silvery white.

Type specimen number 22693, discovered by *A. D. E. Elmer* upon the summit mountain ridge at about 3500 feet altitude, Camp Labi, Province of Nueva Ecija, Luzon, March 1937. A few plants were also seen on the river bed at the camp, evidently washed down from the higher altitudes.

To be compared with *Gynura vidaliana Elm.* from the island of Palawan.

CONNARACEAE

Agelaea platyphylla Elm. n. sp.

A climbing shrub upon small trees. Stem 1.5 cm thick, terete, rebranched, curved and forming tangled masses, the branchlets smooth and glabrous except the young ultimate portions which are yellowish brown hirsute; wood tough, dingy white, covered with smooth grayish white bark. Leaves alternately scattered along the twigs, subchartaceous, the older ones descending, much lighter green beneath, 3-foliolate; petioles 4 to 8 cm in length, slender, strict, minutely pubescent but with age glabrate, its base much enlarged and ascendingly curved; lateral pair of leaflets opposite or nearly so, divaricate, flat, slightly inequilateral, entire, rounded at the base, apex acuminately elongated, murinus and glabrous on the upper surface in the dry condition, brown and puberulent beneath, ovately elliptic in general outline, the largest blades 8 cm wide at or below the middle, 18 cm long, many of them much smaller; the terminal leaf blade upon elongated petiolule up to 3 cm in length, puberulent, somewhat thickened at its distal end, the lateral petiolules 5 to 10 mm long and similarly pubescent; lateral leaf midrib straight but dividing the blade into unequal halves, not so with the terminal leaflet which is normally larger in size than the lateral leaflets, prominent and puberulent beneath, the narrow groove on the upper leaf face is filled with short hairs; nerves 5 more or less on each side of the midrib, much ascending but only a trifle curved upwardly, darker brown and sparsely hirsute on the lower and more prominent leaf surface, tips connected with the coarse reticulations, the basal pair of nerves arising from near the base of the leaf and which extend only up to the middle of the blade. Inflorescence 2 to 4 cm long, axillary,

all its stalks pale green, spreading, soft and softly grayish brown pubescent; main stalks or peduncles few to severally clustered from the same axil, paniculately branched from below the middle, usually subtended by minute and densely yellowish brown pubescent bracts; branchlets filiform, curved and forming an interlaced mass; pedicels similar; calyx linearly lanceolate, densely pubescent, nearly equalling the corolla, spreading; petals white or yellowish so, linear, glabrous, curvingly recurved, alternating with the sepals; stamens erect, the filaments minutely pubescent toward their bases.

Type specimen number 16822, discovered by *A. D. E. Elmer* upon ledges near a stream of a deeply shaded gulch at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Our leaflets are twice as large as those on *Agelaea everettii Merr.*, and there are also some floral differences.

Connarus oliganthus Elm. n. sp.

Apparently a subscandent shrub. Branches terete, tough, 5 mm thick on my specimen, glabrous, the young portion of their branchlets puberulent or finely pubescent; wood white, covered with a smooth brown bark. Leaves scattered along the twigs, oddly pinnate, alternate, often subtending the upper branchlets, persistent, usually 5-foliolate, sometimes only trifoliolate, varying from 6 to 12 cm in length, ascendingly spreading, glabrous, subchartaceous, curing dull brown on the upper side and reddish brown on the lower surface, the lower lateral pair of leaflets smaller than the terminal leaflet; petiole brown, straight, thin except the black colored swollen and usually curved base, 2 to 3 cm long more or less, glabrous, rachis about the same; petiolule averaging 5 mm long, at right angles or slightly ascending to the rachis, blackish brown, sub-

terete, roughened or covered with a minute scurf; the terminal petiolule two to three times as long, very slender and brown except the slightly enlarged black ends; blades with recurved tips, entire, glabrous, oblongish or broadly lanceolate, terminating into a slenderly acuminate point, base mainly obtuse or more cuneate for the upper leaflet which is normally larger than the lateral blades, the basal pair considerably reduced in size, all subchartaceous, opposite or subopposite, 5 to 8 cm long, 2 to 3 cm wide across the middle, occasionally smaller; midrib pronounced beneath, glabrous and brown beneath, impressed along the upper face; nerves 3 or 4 on each side of the midrib, much ascending, the upper ones ascendingly curved, their tips usually interarching, quite conspicuous from the lower side, reticulations none or very obscure. Inflorescence terminal or subterminal, often arising from the upper leaf axils, suberect, the main stalks 1 to 2 dm in length, paniculately branched from below the middle, reddish brown hirsute; the older or secondary branches becoming glabrate, rather slender and divaricately spreading; flowers chiefly clustered from the ends of the short ultimate branchlets, subsessile, densely reddish brown hirsute, 6 mm long, the carinate or obscurely segmented calyx only one third as long as the corolla which is less pubescent especially along the inner surface. Carpels short stipitate, subtended by the distinctly lobed and persistent calyx, 2.25 cm long, 1.5 cm wide across the obscurely oblique rounded top from the compressed side view, faintly striate and puncticulate.

Type specimen number 16750, discovered by *A. D. E. Elmer* rambling in secondary forests at 1250 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July 1916.

Carpels are entirely distinct from *Connarus carnosus Elm.* and *Connarus whitfordii Merr.* Its floral organs are different from those on *Connarus palawanensis Elm.*

CONVOLVULACEAE

Rivea leucocarpa Elm. n. sp.

A low woody climber. Stem the size of an ordinary lead pencil, subterete, flexible, 5 m long, tough, occasionally branched; wood soft, dingy white, with a large pith, slightly odorous; bark smooth, grayish to brown; twigs glabrate, curved, slender, terete, light gray, minutely ridged longitudinally. Leaves scattered but more numerous toward the ends of the stem and branches, subcoriaceous or membranous, nearly flat, horizontal or descending, in the fresh state much paler green beneath, curing very unequally brown, glabrous, entire, apex gradually acute to subacuminate, base broadly rounded, alternate, varying from 10 to 25 cm long without the petioles, 6 to 12 cm wide across the middle or a trifle below this, oblong or subelliptic, lighter brown beneath, the young terminal ones arising from the green and distinctly fluted twigs; petiole 2 to 3 cm long, ascendingly curved, black when dry, glabrous, widely and deeply grooved along the upper side; midrib also black, a trifle curved at the base, glabrous on both sides of the blade, caniculate along the upper side; nerves 4 to 7 from each side of the midrib, ascending, similarly colored, reticulately interarching at their tips, cross bars and coarse reticulations very evident from the lower surface only. Peduncle leaf opposed or from the uppermost leaf axils, 3 to 5 cm long on my specimen, apparently subcompressed and grooved longitudinally, glabrate, usually curved, branched from its distal end; young branches short and olivaceus pubescent, those bearing the fruits 2 to 3 cm in length and at right angles from each other, the ultimate fruit bearing branchlets also very short, crooked and glabrous; floral parts puberulent, upon short and relatively thick pedicels. Berries or drupes ovoidly globose, whitish when mature, upon short glabrate pedicels, 5 mm long, apparently much larger when fresh,

smooth and black, subtended by the 5-segmented and persistent calyx, the narrowly acuminate sepals are widely spreading and glabrate or glabrous.

Type specimen number 15766, discovered by *A. D. E. Elmer* in wet ground of a deeply shaded embankment of a stream at 1250 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916.

Leaves similar to *Rivea luzonensis Hallier* and *Rivea glabrata Elm.*, but inflorescence and infructescence altogether different.

Rivea sorsogonensis Elm. n. sp.

A scandent or twining shrub. Branches terete, light brown, obscurely ridged lengthwise, smooth, glabrous, 4 mm thick on my dry specimen, rather long, curved and twisted, minutely ciliate. Leaves widely scattered and alternate, subcoriaceous, entire, glabrous, much lighter green beneath, when dry brown on the under side and black on the upper side, broadly rounded at the base, gradually tapering from below the base to the acute to acuminate apex, ovately lanceolate in general outline, the larger blades 15 cm long by 6 cm wide below the middle, occasionally smaller in size; petiole 3 to 6 or 7 cm in length, curved and twisted at the base, otherwise straight, slender, blackish brown when dry, glabrate when young, flattened along the upper side especially toward the base, otherwise caniculate; midrib pronounced beneath and in the early state bearing few strigose hairs, plane above, blackish brown; nerves of the same color, glabrate or sparsely strigose, ascendingly curved, 7 on each side more or less, tips interarching, cross bars faint and glabrous. Peduncle up to 18 cm long, very slender, ascending from the leaf axil, somewhat curved, minutely strigose but glabrous when old, bearing a cluster of flowers from its end; the short or very short terminal branchlets villous when young, sub-

tended by unequally sized lanceolate bracts up to 2 cm in length; sepals oblong or subelliptic, 5 cm long or longer, pubescent on the exposed exterior, subpersistent; petals free, long strigose especially on their outer sides, oblong, 5 cm long, 2 cm wide at the middle, blunt at the apex, base narrowed into a broad claw.

Type specimen number 16992, discovered by *A. D. E. Elmer* in light woods among shrubberies at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Quite distinct from our other Philippine materials of the morning-glory family.

CUCURBITACEAE

Alsomitra gracilipes Elm. n. sp.

Apparently a subscandent and rambling vine. Stems very slender, frequently branched, curved, glabrous, longitudinally ridged or fluted, only the young apical portion slightly hirsute, green but brown when dry; branches similar to the stems but thinner, quite long and very slender; tendrils arising from near the petiole bases, wiry, curved and twisted, smooth, brown even in the fresh state, persistent, varying in length up to 10 cm. Leaves well scattered, alternate, membranous, ascending or erect, slightly paler green beneath, usually 3 to 5-foliolate, sometimes appearing with a single or a pair of opposite leaflets, curing greenish on both sides; leaflets unequal in size, flat, usually ovate or ovately elliptic, the obtuse to broadly rounded base little or much inequilateral, gradually tapering to the acute or subobtuse apex, the basal margins entire, otherwise coarsely dentate, the serrately rounded teeth shallow and terminated by a minute acumen, our larger blades 8 cm long by 4 cm wide at the middle but usually considerably smaller; petioles curved from the

base and erect, up to 5 cm long, fluted, puberulent especially toward their distal ends; petiolules varying up to 1 cm in length, subcompressed and puberulent; midrib quite evident and brown colored beneath, striate; nerves faint, 3 to 5, ascendingly curved, reticulations not evident. Inflorescence terminating the final branchlets, gracilis, 10 to 15 cm long, paniculately rebranched, the rather short peduncle leaf subtended, the branches minutely ciliate, alternate and well scattered, usually provided with fine tendrils and subtended by foliaceous bracts, sparingly rebranched from above the middle, secondary and ultimate branchlets subtended by small setaceous bracts; pedicels filiform, 2 to 3 mm long including the turbinate small calyx, puberulent; corolla twice as long, the segments subacute.

Type specimen number 15304, discovered by *A. D. E. Elmer* in thickets at low altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

Related to *Alsomitra integrifoliola* (*Cogn.*) *Hayata*. By mistake it was distributed as a new species of *Columella*.

CUNONIACEAE

Weinmannia bulusanensis Elm. n. sp.

A small crooked tree. Stem numerously rebranched, the branchlets terete and brown; twigs ascending, numerous, slender, greenish but brown when dry, stigosely pubescent, soon becoming glabrate on the older ones, binately rebranched. Leaves profuse, chiefly ascending, in opposite pairs from the upper parts of the twigs, 5 to 12 cm long including the petiole, oddly pinnate, occasionally evenly pinnate, subtended by foliaceous bracts, leaflet bearing from below the middle; petiole greatly varying in length, 2 to 3 cm long or much shorter, strigose or finely pubescent and with ciliate hairs, strict; interaxillary stipules or bracts rotund, 1 cm across, entire or nearly so

and glabrate except the sessile base beneath, prominently punctate and veiny on the lower side; leaflets membranous, 3 to 5 opposite pairs, subolivaceus green even in the dry state, gradually reduced toward the base, the lowest ones broadly elliptic, the normal lateral ones oblong, the largest ones at the distal ends of the hirsute rachis, subsessile or the terminal leaflet with a very short petiolule, crenate except the subobliquely obtuse to rounded and entire base, obtuse toward the apex, 1.5 cm wide at the middle, 5 cm long or shorter, curing lighter green beneath, sparsely ciliate or glabrate and light punctate beneath, glabrous on the upper side; midrib brown, conspicuous beneath, pubescent but only minutely so along the upper face of the leaflet; nerves many, faint, almost at right angles to the midrib, the distal one half portion reticulately united. Spikes erect or ascending, terminal, equalling the foliage, densely puberulent or subvelutinous, solitary or few clustered from the uppermost leaf axils, seldom forked from near the base, strict, flower or fruit bearing from below the middle, comparatively slender; pedicels solitary or few clustered, alternately scattered or grouped, at right angles to the rachis, very thin, covered with a yellowish gray tomentum, 1 to 3 mm long; calyx on our specimen shriveled but persistent, small. Capsule fully twice as long as its pedicel, subterete but finally divided into two divergent carpels which bear the filiform and persistent style, puberulent, reddish brown.

Type specimen number 17293, discovered by *A. D. E. Elmer* in woods of secondary forests at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

This, with the following new species and including *Weinmannia camiguinensis Elm.* from a small natural group of closely related species yet quite distinct from one another.

Weinmannia irosinensis Elm. n. sp.

A burly tree. Trunk 3 dm in diameter, subterete, 10 m high, with main branches from below the middle; wood moderately hard, whitish; bark gray, usually scaling in small plates, latericius except the outer surface; branches ascending, crooked, ultimately numerously and laxly rebranched, terete, gray to brown; twigs opposite, also terete, the green terminal portions soft pubescent and somewhat flattened at their ends, ultimately becoming glabrate when old. Leaves imparipinnate, 4 to 7 cm long including the petiole, profuse, ascending or horizontal, with 3 to 5 pairs of sessile leaflets, opposite, subtended by deciduous interaxillary bracts or stipules, leaflet bearing from near the base; petiole relatively short, straight, strigose, brown when dry, the rachis similar in color and pubescence; stipule 7.5 mm wide, coriaceous, entire, subreniform, glabrous except the basal lower portion, prominently light colored punctate and veiny on the lower surface; leaflets submembranous, much paler green beneath when fresh, drying nearly equally brown, the larger ones 3 cm long by 7.5 mm wide across the middle, often smaller especially the basal ones which are much shorter for their length, lanceolate or the basal ones subelliptic, frequently the lateral ones linear in shape, gradually tapering to the acute apex, edges along the upper half of the blades obscurely and coarsely crenately dentate, margins of the basal portion entire at the obliquely obtuse to obtusely rounded base, glabrate on both sides and punctate; midrib raised beneath, hairy, impressed on the upper surface; nerves very faint, at right angles or rather divaricate, coarsely reticulated. Spikes equalling the foliage, ample, erect, all the stalks greenish, dark or dull brown when dry, soft pubescent, solitary or few from the uppermost leaf axils; peduncles short, the longer rachis portion flower or fruit bearing; pedicels divaricate, filiform, solitary or few clustered, alternate, only a few mm in length,

puberulent, dull reddish brown. Capsule fusiform, grayish pubescent, equalling or longer than the pedicels, dehiscing into two distinct carpels which bear the persistent styles.

Type specimen number 14918, discovered by *A. D. E. Elmer* in woods at the upper edge of a nearly precipitous decline into a stream at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

The leaves and spikes on our specimen are only one half as large as those on *Weinmannia camiguinensis Elm.*

DILLENIACEAE

Saurauia bulusanensis Elm. n. sp.

An undershrub. Stem 3 cm thick or more, subterete, 3 m high, branched from below the middle; wood soft, sappy white, covered with a smooth grayish green but when old dull brown bark; its branches spreading, laxly rebranched; twigs slender, smooth, the young apical portions greenish and scurfy, appearing angularly compressed. Leaves alternate from the distal ends of the branchlets, flat, subcoriaceous or submembranous, much lighter beneath in the fresh and in the dry leaves, chiefly horizontal, glabrous except the midrib beneath, the upper surface blackish brown when dry, minutely serrate along the margins especially toward the acuminate apex, base cuneate or many of them obtusely rounded, oblongish to broadly oblanceolate, the larger blades 5 by 15 cm, the few smaller blades 3 by 7 cm in size; bud bracts densely covered with appressed spicules; midrib plane on the upper surface, rather prominent beneath, darker brown than the blade, very sparsely scurfy and becoming glabrous; nerves 6 to 8 on each side of the midrib, faint and glabrous, ascending, curved especially toward their ends, cross bars and reticulations evident from the lower side only; petiole range from 1.5 to 3 cm in length, more or less scurfy es-

pecially the young terminal ones, leaving scars after falling. Flowers pendant upon recurved pedicels, solitary or few clustered from the lower leaf axils or from the axils of the fallen leaves along the branchlets; pedicels up to 8 mm in length, slender, ciliately scurfy; calyx rather thick along the center and with few scattered light brown spicules on the dorsal side of the more or less pointed segments which are about 3 mm in length; corolla rotately spreading, pink to white, glabrous, united at the base and falling as a whole, longer than the calyx, the 5 segments oblong, blunt at the apex; anthers yellow, their filaments auranticus. Fruits also pendant, greenish in the mature state.

Type specimen numbers 16407, 16580 and 14369, discovered by *A. D. E. Elmer* as an undershrub in alpine woods from 1500 to 2750 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915 and June to July 1916.

Nearest related to *Saurauia oligantha Merr.* More distantly related to *Saurauia sparsiflora Elm.*

Saurauia irosinensis Elm. n. sp.

Small tree or shrub like. Stem terete, 2 dm thick, 7 m high, branched from below the middle; the main or larger branches ascending and widely spreading, freely rebranched; twigs slightly ascending, dark brown when dry, the upper portion green when fresh, the young tips covered with a lighter colored spicular scurf which fall off on the older twigs, terete, about 6 mm in diameter, the leaf bearing portion sometimes appearing a trifle compressed; bud bracts heavily beset with a similar scurf. Leaves horizontal or descending, flat or nearly so, subcoriaceous, somewhat paler green on the lower surface, also curing lighter brown beneath, alternatingly scattered or crowded along

the branchlets, glabrous on the upper side, also on the lower side except the veins and minute grayish white dots among the reticulations, oblong to oblanceolately oblong, the subentire margins finely serrate or entire toward the subcuneate base, apex acute to subacuminate, the average blades 15 cm long by 5 cm wide at the middle or more commonly above the middle; midrib pronounced, duller brown and sparsely scabrid along the lower surface; nerves 5 to 9 on each side according to the size of the leaf, similar in color and vestiture beneath, relatively faint, ascending, tips ascendingly curved, reticulations evident on the lower side; petiole covered with a light brown spicular scurf, ascending, up to 3 cm in length. Inflorescence chiefly from the uppermost leaf axils, shorter than the foliage, green, subpendant, very lax and flexible, short branched toward the top; peduncle 6 cm long, sparsely scurfy, appearing slightly compressed and grooved along the sides; lower branches subtended by a pair of bracts which are glabrate and ovately oblong in shape, 1 to 1.5 cm in length; upper short branches densely scurfy and subtended by small linear bracteoles; pedicels 1 to 1.5 cm long, similar in vestiture; sepals thick, on their backs scurfy, pointed; petals longer than the sepals, glabrous, white, the 5 styles also white; stamens yellow especially the anthers. Fruit dark green; seeds chocolate brown, imbedded in a slimy juice.

Type specimen numbers 14581 and 15219, discovered by *A. D. E. Elmer* in well drained good soil of woods at 500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October and November 1915.

Very distinct from 944 *Cuming* or *Saurauia latibractea Choisy*, and from 455 *Cuming* or *Saurauia cumingiana De Vriese*. The latter number is doubtfully referred here.

ELAEOCARPACEAE

Elaeocarpus merrillii Elm. n. sp.

A small much branched tree. Branches terete, 5 mm thick, gray to brown, nearly smooth, numerously rebranched toward the ends of the main branches; twigs often clustered in small whorls, also terete, usually roughened below the foliage by the leaf scars, the young portion distinctly ridged longitudinally, glabrous, greenish but blackish brown when dry, bearing very numerous leaves from all sides and about 3 mm thick in the dry state. Leaves alternate and closely set, coriaceous, flat, glabrous, ascending or horizontal, copious, the basal one third to one half entire, obscurely crenately or serrately toothed otherwise, especially so toward the slightly recurved and bluntly acute apex, curing dark brown on the upper side and lighter brown beneath, the average blades without their petioles 2.5 cm long by 1.25 cm wide across the middle, acute to subobtuse at the base, oblongish to obovately oblong, the smaller ones broadly oblanceolate, impressed along the upper median line; midrib dark brown and relatively conspicuous beneath, sunken on the upper side toward the petiole, smooth and glabrous; nerves scarcely visible, 2 to 3 on each side of the midrib, ascending, slightly curved, eglandular at their axils; reticulations very fine and minute, more evident from the lower surface; petioles 1 to 1.25 cm long, glabrous, narrowly grooved along the upper side, slender, curing nearly black. Flowers not seen. Infructescent spikes up to 7.5 cm long, axillary or lateral, slender, ascending, glabrate, brownish black when dry, slightly thickened toward the base, fruit bearing from the middle or primarily toward the top; pedicels very slender, 1 cm long or shorter, ascending, not numerous, alternating and well scattered, leaving large scars after falling, nearly glabrate when old; fruits ovately elliptic, less than 1 cm long in the wrinkled dry state, smooth and aerugineus in

the fresh condition, light gray on my dried specimen, obtusely rounded at the apex, truncately rounded at the base and subtended by a whorl of calyx vestiges which seem to be persistent.

Type specimen number 17133, discovered by *A. D. E. Elmer* along wooded ridges of the higher altitudes, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

Most closely related to *Elaeocarpus argenteus Merr.*, but our more numerous leaves are much smaller and our spikes are laterally scattered, not terminally clustered. Named after *E. D. Merrill.*

ERICACEAE

Vaccinium sorsogonense Elm. n. sp.

A coarse epiphytic shrub. Primary stems few from the base, terete, ascending, 5 to 8 cm thick, 3 to 5 m long, repeatedly branched from near the base, ultimately numerously rebranched; wood whitish, hard; bark smooth or scaling toward the base, gray to brown; twigs alternate, comparatively slender, spreading, glabrous, leaf bearing toward their ends. Leaves alternate, coriaceous, horizontal or descending, much lighter green on the lower side, flat or folded, entire, glabrous, elliptic to short oblong in shape, base broadly obtuse to obtusely rounded, the abruptly acuminate apex strongly recurved and frequently turned to one side, curing duller brown above, 7 to 10 cm long including the petiole, 3 to 6 cm wide across the middle; midrib raised or ridged beneath, shallowly sunken along the upper side toward the base, glabrous, smooth, dark brown on my herbarium specimen, extending clear into the apex; lateral nerves of 2 pairs, the main pair arising 1 cm from above the base of the blade, the lesser pair arising only a few mm from the base of the leaf blade,

much ascendingly curved toward the apex, the secondary nerves arising from above the middle of the leaf are very faint; reticulations obscure; petioles stout, subcompressed or shallowly grooved along the upper surface, blackish brown when dry, ascending or recurved, glabrate, 5 to 8 mm long, leaving scars after falling. Flowers not known. Spikes terminal, 1 to 3, ascending or pendantly recurved toward their ends, fruit bearing from near the base, 1.5 to 2 dm in length; peduncle and rachis are puberulent, subangular or longitudinally ridged; young fruits alternately clustered, subglobose, greenish in the fresh state but turning cinereously gray when dry, so also the 5 minute calyx teeth and the thickened rim of the ovary top, becoming detached at the base by a constriction from the pedicel which is usually enlarged at that point; pedicels averaging 1 cm in length, cinereous, divaricate, subpersistent, longitudinally fluted, subtended by glabrous, brown colored, ovately lanceolate and persistent bracts of an equal length.

Type specimen numbers 16912 and 17026, discovered by *A. D. E. Elmer* in rocky ground of densely wooded steep slopes facing the Pacific ocean at 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Not having the corollas in hand, it is difficult to give its nearest ally — *Vaccinium barandanum Vid.* or *Vaccinium philippinense Warb.* The spicate infructescence, cinereous fruits and minor leaf characters of our specimen seem to differ from both of the above named species.

EUPHORBIACEAE

Antidesma frutiferum Elm. n. sp.

A gnarly and medium sized tree. Trunk 4.5 dm in diameter, irregularly round, 10 m high, branched from above the middle; wood hard, reddish brown especially

toward the center; bark relatively smooth, yellowish gray, reddish colored next to the sapwood; branches numerously rebranched toward their ends, terete; twigs bearing short lateral branchlets, smooth, gray, glabrous even their young tips. Leaves copious, subdeciduous, coriaceous, mainly descending, lucid on both sides when fresh, conduplicate and with recurved acute to acuminate apical points, base mostly rounded, entire, ovately oblong or subelliptic in shape, my larger blades measure 10 cm long without the petiole, one half as wide at or below the middle, glabrous except the midrib beneath, curing brown but lighter brown beneath, our smallest blades only one half the size of the larger ones; midrib pronounced beneath especially toward the base where it is usually puberulent, nearly black in the dry state; nerves 5 or 6 on each side from the midrib, ascending, only slightly curved except at their distal ends, quite conspicuous from the lower surface, similar in color as the midrib, cross bars with reticulations obscure; petioles averaging 1 cm long, yellowish gray puberulent, ultimately becoming glabrate, black on my specimen, narrowly grooved along the upper side. Infructescence very frutiferous, terminal but chiefly axillary, 3 cm long or the terminal ones shorter, suberect, greenish, finely pubescent in the early state, branched from below the middle or from near the base; branchlets distinctly divaricate, up to 2 cm in length. Fruits sessile or upon very short and pubescent pedicels, more tapering toward the base than the abruptly pointed apex, 2 mm long or shorter, appearing rugose not carinate, fusiform not compressed, subtended by minute sharply apiculate and persistent bracts, glaucous green, red and finally black.

Type specimen number 14508, discovered by *A. D. E. Elmer* in damp rocky ground of humid woods at 2500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

As near to *Antidesma curranii Merr.* as to any of our other species of *Antidesma.*

Glochidion pubicarpum Elm. n. sp.

A small crooked tree. Main branches chiefly at the top and forming a flattened crown; secondary branches widely spreading, the branchlets lax and numerous, divergently scattered; twigs very slender, smooth and even their young tips glabrous, curing nearly black. Leaves well or evenly scattered, alternate, glabrous, lighter green beneath, when dry unequally brown on the two sides or more nearly black on the upper surface, deciduous, variable in size, entire, gradually tapering to the acuminate apex which is often curved to one side, base subequally obtuse or slightly inequilateral and obtusely rounded, broadly lanceolate or ovately oblong, the larger blades 10 cm long by 4 cm wide across the middle or more often below the middle, the smallest blades 1.5 cm wide and 4 cm long, thinly coriaceous, only a trifle inequilateral; midrib rather prominent from both sides, glabrous, nearly black on my specimen, straight or slightly curved; nerves 3 to 5 on each side of the midrib, more evident on the lower face, ascendingly curved, cross bars faint; petioles 5 to 8 mm long, of the same color when dry, thin, entirely glabrous. Fruits in dense glomerules from the axils of the leaves or from the scars of the fallen leaves, abundantly scattered along the thin ultimate twig branchlets which also bear the leaves; peduncles 2 to 5 mm long or shorter, stout, appearing angular, subtended by minute and light brown persistent bracts, sometimes the peduncle with 2 or 3 capsules is absent and the capsule is borne by the pedicels which are about as long but relatively thinner, also subtended by bracteoles; calyx with pedicels persistent, glabrous, subovate, 1.5 mm long, rotately spreading; capsules compressed, the apical sunken portion terminated by a blunt and very short point, 6 mm in diameter but larger

when fresh, the puberulent carpels forming a solid wheel like fruit, the young ones are finely pubescent.

Type specimen numbers 15498 and 15379, discovered by *A. D. E. Elmer* among shrubs and trees along a creek at 1250 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

This and the following new species of *Glochidion* are distinct from *Glochidion robinsonii Elm.*

Glochidion sorsogonense Elm. n. sp.

A low but stocky tree. Main branches toward the top, widely spreading and forming an umbrella shaped crown; branchlets numerous, lax, terete, grayish brown, smooth; twigs very slender, the fruit bearing portion thin, the young tips yellowish brown pubescent. Leaves alternate, easily falling, diverse in size, ascending or the lower older ones descending, membranous, many, scattered along the twigs, glabrous except the midrib and nerves, when dry blackish brown on the upper side and glaucous white beneath, the older blades less glaucous white, ovately lanceolate to ovately oblong, inequilateral especially toward the oblique base which is either broadly obtuse or obtusely rounded, entire, gradually tapering into the acute to acuminate apex, flat, my largest blades are 4 cm wide toward the base, 10 cm in length, the smaller blades about one half as large; midrib conspicuous beneath, puberulent on both sides but more densely so or pubescent beneath, usually a trifle curved toward the base; nerves quite evident and also puberulent especially on the lower surface, about 5 on the narrower leaf side and about 6 on the wider leaf side, the smaller blades with 1 or 2 less nerves, suboblique, slightly curved, more numerous from near the base, cross bars few and faint; petioles 5 mm long or less, finely yellowish brown pubescent, leaving raised scars, subtended by short and persistent stipular bracts. Fruits clustered

from the leaf axils or from the axils of fallen leaves, upon puberulent pedicels up to 3 mm long and which are subtended by minute bracteoles; calyx segments rotately spreading, small, subglabrous, subelliptic; capsule usually divided into 3 main divisions, slightly puberulent, compressed, sunken at the apex and which bears the persistent columnar style.

Type specimen number 15307, discovered by *A. D. E. Elmer* in light woods at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

Quite different from *Glochidion canescens Elm.*

Trigonostemon bulusanensis Elm. n. sp.

A small erect tree. Branches rebranched; the branchlets alternate, crooked and rigid, terete, gray and minutely checked; the young twig portion smooth, glabrous, green or when dry dull brown, also terete or nearly so. Leaves alternate, rigidly coriaceous, conduplicate or nearly flat, ascending or horizontally spreading, glabrous, smooth and shining on the upper darker green surface, avellaneus on my herbarium specimen especially on the nether side, entire, oblongish in shape or very broadly lanceolate, the larger blades 15 cm long without the petioles, 6 cm wide at or below the middle, the smaller ones 4 by 8 cm, base broadly obtuse to obtusely rounded, the apical portion gradually extended into a blunt point which in most of them is a trifle bent or curved to one side; midrib more evident from the lower side, darker colored when dry, often a little curved toward the distal end; nerves up to 9 on each side of the midrib, comparatively thin or obscure, slightly ascending, their tips ascendingly curved and faintly interarching, avellaneus, reticulations obscure; petioles varying from 1 to 3 cm in length, glabrous, blackish brown in the dry state, deciduous, slightly enlarged at or toward the base, deeply channelled along the upper side for the whole length, leav-

ing small light colored scars upon falling. Inflorescence terminal or suberect from the axils of the uppermost leaves, equalling the foliage or longer, rather rigid, averaging 2 dm long more or less, alternatingly branched from the middle; peduncle terete, glabrous, much ascending, one third the length of the inflorescence, dull brown; branches few, suberect, reddish brown and longitudinally ridged or grooved, sparingly short rebranched; secondary branchlets subtended by short apiculate and persistent bracts, the ultimate branchlets subtended by glabrous, ovate to oblong, 3 to 6 mm long bracteoles; the final branchlets very short, clustered, persistent and minutely bract subtended; pedicels 5 mm long, slender; calyx broadly cup shaped, very bluntly toothed, wider than long, one third as long as the corolla, glabrous; petals obovately oblong, spreading, glabrous, 4 to 6 mm long, white; stamens shorter than the corolla.

Type specimen number 17296, discovered by *A. D. E. Elmer* in dense well shaded woods at 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

This plant has features of *Trigonostemon philippinensis Stapf*, but our leaves are different in shape and texture, and its flowers are white not yellow.

FAGACEAE

Quercus bulusanensis Elm. n. sp.

A rather small tree. Stem 2.5 dm thick, 8 m high, chiefly branched from the middle and above it; main branches ascending, numerously rebranched; wood hard, dingy white; bark comparatively thick, rather smooth, mottled or blotched; the larger twigs terete, smooth, frequently crooked, curing gray to brown; secondary branchlets slender, mostly terminal, erect or ascending, also terete, greenish when fresh, alternate, covered with a dull cinnamon colored puberulence. Leaves descending or ascending toward the

top, subcoriaceous, curvingly folded upon the upper darker green side, much lighter green beneath, the upper side sublucid and very sparingly puberulent or glabrate, entire, the lower surface covered with a very fine indumentum which in the dry state appears grayish white, copious and alternately scattered, broadly lanceolate to lanceolately oblong, the obtuse base abruptly extended into the petiole, gradually tapering into the slender or extended apex which in most leaves is turned to one side, 10 cm long by one third as wide across the middle or just below it, quite often or more often smaller in size; midrib very dark brown on my specimen, raised especially along the lower surface, puberulent on both sides; nerves similar in color, oblique, very evident beneath but obscure from the upper side, glabrate, tips ascendingly curved, about 6 to 8 from each side, of the midrib, cross bars or reticulations obscure; petiole 5 mm long more or less, blackish brown, stout, more or less flattened along the upper side, straight or curved, puberulent. Inflorescent spikes alternately clustered and terminal, ascending, strict or curved, 7 to 12 cm in length, quite slender, densely beset with flowers clear to the base or near to it, short but densely yellowish brown pubescent when dry; flowers sessile, in small groups; stigmas reddish brown, smooth, the ovary covered with dense grayish white hairs or wool; perianth puberulent. Fruiting spikes 2 dm long, much roughened by the flower and fruit scars; cups nearly 2 cm across, upon short and thick stalks, subpersistent, rather flat or shallow with their edges slightly enclosing the fruit, the exterior smooth and with 3 or 4 transverse rings or circles; nut or acorn 1.5 by 2 cm, flat or truncate at the base, conical in shape, gradually rounded or curved toward the apical and 3-pointed mucro, covered with a light brown indumentum even when old.

Type specimen number 14537, discovered by *A. D. E. Elmer* on steep ridges in moist rocky ground of the hemp

region at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

To be compared with *Elmer* 8185 from Lucban and Bureau of Forestry number 7911 from mount Banahao, which flowering and fruiting specimens are considered typical *Quercus philippinensis A. DC.*

FLACOURTIACEAE

Casearia elliptifolia Elm. n. sp.

A small erect or shrub like tree. Stem up to 15 dm thick, terete, crooked, about 8 m high, branched from below the middle or mainly toward the top; wood moderately soft or hard, yellowish white, odorless and tasteless; bark smooth or more or less lenticelled, castaneus except the surface, grayish green or gray on the older portion; main branches rebranched; twigs terete, 5 mm thick when dry, glabrous, relatively short, grayish brown, rather slender. Leaves copious, alternate, coriaceous or chartaceous, nearly flat, horizontally spreading, much lighter green beneath, drying unequally brown on the two sides, entire, glabrous, abruptly obtuse at the apex, base rounded or broadly obtuse, 8 to 12 cm long, 5 to 8 cm wide across the middle, often smaller in size especially in length, rotund to elliptic; petiole 5 mm long, blackish, caniculate along the upper side, glabrous, leaving circular scars after falling; midrib raised beneath, nearly plane above, also glabrous, dark reddish brown on the lower side when dry; nerves 4 to 6 on each half of the blade, conspicuous beneath, ascending; cross bars faint beneath, not evident from the upper side. Flowers erect from the leaf axils or from the axils of their scars, clustered, yellowish green, odorless, upon a few mm long stalks which are glabrous and bract subtended; buds of closed flowers ovoidly ellipsoid; sepals or petals 5, glabrous; stamens apparently 8, shorter

than the segments; staminodes erect, grayish white ciliated at their tips. Fruits erect, 1 to 1.25 cm long, glabrous but verrucose, subelliptic; the spreading carpels also verrucose on the ventral side, lemon yellow, the central axis with erect seeds persistent and deep red.

Type specimen numbers 15175 and 14686, discovered by *A. D. E. Elmer* on a forested ridge at 1000 to 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October and November 1915.

At first I thought of letting it pass as *Casearia loheri Merr.*, but upon a closer examination I consider our numbers sufficiently distinct.

GENTIANACEAE

Microphium palawanense Elm. n. sp.

A bi or perennial herb. Stems erect, terete, smooth, quite rigid, straight, 6 dm long, 5 mm thick in the dry state, unbranched, clothed with a yellowish brown puberulence, becoming glabrate toward the base, arising from a short subligneous root; rootlets numerous, wiry, forming an interlaced mass. Leaves opposite, well scattered all along the stem, submembranous, sessile, linearly oblong, the larger ones 10 cm long by 3 cm wide, gradually becoming reduced toward the distal portion of the stem. apex obtuse to obtusely rounded, flat, entire and minutely ciliate along the edges, clasping at the base, leaving annular scars after falling, puberulent beneath especially along the midrib and nerves, curing dirty brown on both sides, glabrate on the upper darker green surface; midrib pronounced beneath, dark brown, finely pubescent; nerves very oblique, about 3 pairs, much ascending especially the stronger pair which arises from near the base of the midrib, all the nerves brown and puberulent beneath; re-

ticulations none. Panicle terminal, erect, 2 dm long by one half as wide; main branches in opposite pairs, strictly ascending, subtended by foliaceous bracts, glabrate or puberulent, very slender, rebranched from below the middle; branchlets sparingly rebranched, subtended by bracteoles; pedicels 1 cm in length, usually somewhat recurved. Flowers yellowish, subpendant; calyx thick, boot like, glabrous, greenish, 5 mm long or less, obliquely truncate at the apex and split open on one side down to the middle; corolla free, erect, 8 mm long, glabrous, the basal half united and rather pointed at the base; the 5 segments yellow, oblong to lanceolate, 4 mm long by 1.5 mm wide, faintly 3-veined; stamens 5, erect, glabrous, the filaments attached half way down to the thick corolla tube, flattened but very linear, 2 mm long; anthers deeper yellow than the filaments, basifixed, laterally dehiscent, somewhat narrowed toward the obtuse apex; ovary apparently 1-celled, divided by sutures, compressed, obovoid, the sides rugulose but glabrous, free and superior, at the base subtended by minute glands, 3 mm long by 2 mm wide across the truncately rounded apex; ovules numerous in each half; styles 2, equalling the ovary, free, stigma slightly thickened. Capsules subtended by the persistent calyx and usually terminated by the styles, obovoidly ellipsoid, 4 mm long, crustaceous and rugosely marked, dehiscent along the sutures; seeds many, hard, irregular in shape, 0.5 mm thick, obscurely ridged, latericius in color.

Type specimen number 12923, discovered by *A. D. E. Elmer* in wooded flats along the Iwahig river at 750 feet altitude, Puerto Princesa (Mt. Pulgar), Island of Palawan, April to March 1911.

Distributed under the genus *Lysimachia*, but it is here published under *Microphium*. Besides this species there is only one other known in the Malayan Peninsula.

GESNERIACEAE

Cyrtandra peninsula Elm. n. sp.

A suffrutescent shrub. Twigs crooked, terete, more or less finely ridged or fluted, the young tips yellowish brown tomentose, glabrate on the stem and older branches. Leaves ample, membranous, scattered in unequal opposite pairs, ascending toward the top, the lower ones descending, drying much lighter brown on the lower side, the larger blades 7.5 cm wide by 2 dm long, the lower or smaller ones 5 cm wide by 10 cm in length without the petioles, unequally sided toward the obtuse or obtusely rounded base, frequently a trifle arcuate in shape, tapering into the sharply acuminate apex, margins minutely apiculate and in the young ones yellowish pubescent, subentire toward the base, sparsely ciliate on both surfaces, lanceolately oblong in outline or the basal ones broadly lanceolate; petioles varying from 2 to 5 cm in length, strict, dull brown pubescent, leaving roughened scars after falling, usually provided with interaxillary bracts; midrib raised beneath especially toward the base, plane on the upper side, when young densely yellowish or golden brown pubescent; nerves 6 to 10 on each sides, ascending and usually curved toward their ends, similar in pubescence and more evident from beneath; reticulations very faint or none. Inflorescence erect, from the uppermost leaf axils; peduncle 2 cm long, often longer or much shorter, strict, relatively stout, densely yellowish brown pubescent, flower bearing from their distal ends; flowers in subumbellate clusters, sessile or short pedicelled, dark reddish brown hirsute, subtended by lanceolate bracts, when old becoming glabrate; calyx 1.5 cm long, united at the narrowed base, terminated into 5 setaceous points which soon withers, more densely pubescent around the base; corolla up to 3.5 cm long, narrowly tubular toward the base, campanulately inflated form below the middle to

the oblique throat, sparsely strigose on the exterior; lobes subequal, short and broad, spreading.

Type specimen number 15699, discovered by *A. D. E. Elmer* in damp ravines at 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916.

Leaves are the same as those on *Cyrtandra membranifolia Elm.*, but our flowers are different.

Cyrtandra umbrina Elm. n. sp.

Coarse erect or suberect perennial herbs. Stems subterete, up to 6 dm long, occasionally branched, dull green, 1 cm thick or thinner on my specimen, curing blackish brown, crooked or curved, obscurely angular or longitudinally grooved, decumbent at the base, young portion reddish brown, puberulent or pubescent, soon becoming glabrate, taking root along the lower basal portion. Leaves copious, persistent, erect or ascending from the base, succulent, the lower ones horizontally spreading, very dull or dark green on the upper side which in the dry state turns nearly black, much lighter green beneath and turning umbrinus when cured, glabrate on both sides except the midrib and nerves, their surfaces appearing minutely blistery on both sides, more or less clustered toward the distal ends of the stems and branches, subsessile, oblanceolate in outline but gradually narrowed toward the base, 2 dm long by 3 to 5 cm wide above the middle, at or near the rounded base 1 cm wide only and usually folded, otherwise nearly flat, margins serrately toothed toward the acute to acuminate apex, the narrowed basal portion of the blade subentire, leaving rough scars after falling; midrib stout beneath, appressed hairy, much darker or reddish brown than the leaf surface in the dry state beneath, slightly grooved on the upper side toward the base; nerves 5 to 8 on each side of the midrib counting the short ones toward the base, much ascending and curved, also reddish

brown beneath when dry, puberulent; reticulations few or very coarse but quite evident from beneath. Inflorescence from the leaf axils or in the axils of their scars, usually upon short hairy stalks or peduncles; flowers upon short pedicels, crowded in a capitate cluster and subtended by lanceolate bracts of unequal sizes and which when old become nearly glabrous; calyx boot like, 1.5 cm long, hirsute, glabrate when old, terminated by short and blunt teeth; corolla white, 4 cm long, tubular and only the broad segments spreading, a trifle narrowed at the base, externally long strigose. Young fruits 2 cm long, ascending, subterete and pointed, yellowish gray, conspicuously checked on the exterior.

Type specimen number 16537, discovered by *A. D. E. Elmer* in rich black moist ground of dense wooded flats at 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July 1916.

In the group with *Cyrtandra humilis Elm.* and nearest to *Cyrtandra glaucescens Krzl.* Our calyx segments are obtuse to subacute, not slenderly acuminate to setaceous. Corolla more tubular and throat less spreading. Leaf margins serrate rather than crenate.

Cyrtandra vulcanica Elm. n. sp.

A coarse undershrub. Stem angularly ridged; branches pale green when fresh, nearly black when dry, longitudinally fluted, 1.25 cm thick, glabrous or becoming so when old. Leaves opposite, coriaceous, much lighter green beneath or nearly whitish, ascending, primarily flat with recurved tips, broad, lanceolately oblong or merely oblong, widest across the middle or a trifle below it, gradually tapering from the middle to the acute to acuminate apex, base obtuse but sides unequally terminated, margins entire below the middle, the margins above the middle or toward the apex minutely crenate or subentire, the lower portion

usually inequilateral, curing blackish brown on the upper side, castaneus beneath, varying 15 to nearly 25 cm long without the petioles, 5 to 10 cm wide, occasionally of much smaller size, glabrous on both sides; petioles glabrate, pink, turing black when dry, 8 to 12 cm long, rather straight and ascending, expanded at the base, subpersistent, coriaceous; midrib conspicuous and blackish brown on the nether side, also glabrous, flat on the upper surface; nerves similar in color beneath, subparallel and ascendingly curved especially toward their distal ends, also glabrous, more evident on the lower surface, 7 to 12 on each side of the midrib; reticulations faint, evident from beneath only. Floral pedicel very slender; calyx 5 mm long, slenderly toothed; white corolla 1 to 1.5 cm long. Infructescence young on our specimen, ascending from the leaf axils, 5 to 8 cm long including the purplish peduncle, verticellately branched from above the middle, glabrous, drying blackish brown, the branchlets subtended by thickened bracts; pedicels red to purple, varying from 1 to 2 cm in length, mostly in subumbellate clusters, straight or curved, subtended by thickened bracteoles; young fruits fusiform, pointed, subtended by a thick persistent calyx rim.

Type specimen numbers 17388 and 15349, discovered by *A. D. E. Elmer* in very dense, wet and shady slopes of the volcano, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

Leaves almost identical to those on *Cyrtandra sibulanensis Elm.*, but inflorescence distinct.

GUTTIFERAE

Calophyllum sorsogonense Elm. n. sp.

Apparently a small or middle sized tree. Main branches rigid, terete, spreading, numerously short rebranched toward their ends; wood hard, covered with gray to brown

bark; twigs opposite, ascending, stiff, subterete, yellowish gray to brown, the apical portion angularly compressed and more or less longitudinally ridged, the young terminal portion ferruginous pubescent; bud bracts lanceolately compressed, at least 1 cm long, densely ferruginous. Leaves rigidly coriaceous, curing nearly equally brown on both sides, oblong, glabrous except the midrib beneath, sessile or nearly sessile, numerous, flat, ascending or horizontally spreading, entire, elliptically oblong, 4 cm wide across the widest middle portion, 10 cm long but often somewhat smaller, tapering toward both ends, obtuse or obtusely rounded at the apex, base similar in shape; midrib ridged beneath, gradually enlarged toward the ferruginous base which is of a darker brown on my dry specimen, on the upper side widely scooped out toward the base; nerves very numerous and parallel, subdivaricate, obscure from both sides. Inflorescence chiefly axillary, spreading, yellowish in the fresh state but curing dark or blackish brown, glabrate; peduncles solitary or few clustered, the main stalk with a pair of minor stalks arising from near the base of the central one, 1 to 1.5 cm in length, stout, straight, bearing from their distal end a whorl of flowers; pedicels as long or longer than the peduncles, comparatively slender, slightly unequal in length, usually curved, subtended by minute bract vestiges; outer floral parts glabrous or finely ciliate along their margins, well covering the inner floral organs, ultimately spreading.

Type specimen number 17385, discovered by *A. D. E. Elmer* in the woods at medium altitudes, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

Differs from *Calophyllum zschokkei Elm.* by the ferruginous young twig portion and the midrib along the lower side of the leaves. Our specimen is the second species in our islands of *Calophyllum* with truly oblong and sessile leaves.

Garcinia bulusanensis Elm. n. sp.

A little and erect tree. Stem 25 cm thick, 8 m high, branched mainly toward the top; wood whitish, soft, bitterish; bark dark brown or castaneus, the middle portion testaceus, the inner portion yellowish, with an abundance of sticky luteus colored sap; branches spreading, numerously rebranched, the branchlets very lax, green at their apical ends; twigs oppositely short branched, longitudinally fluted or ridged, glabrous, the older portion grayish white, the very slender young or terminal portion yellowish brown on my dried specimen. Leaves thinly coriaceous, entire, conduplicate, paler green beneath when fresh and much lighter brown when dry, the upper surface blackish brown on my dry specimen, opposite, widely scattered along the twigs and branchlets, ascending or mostly horizontal, glabrous, the larger or normal blades 4 cm wide across the middle and 10 cm in length, the sharply acute to acuminate apex usually turned to one side, base obtuse or broadly so, oblong or subelliptically oblong, the smaller ones slightly inequilateral especially at the base; the subnormal class of leaves obovate in shape, broadly rounded and most of them subemarginate, cuneate at the base or broadly rounded in the smaller subrotund leaves, frequently inequilateral, 4 to 7 cm long, 4 to 5 cm wide near the top; midrib smooth, similar in color to the blade on both sides, those of most of the subnormal blades terminated into dwarfed pouches; nerves less prominent, 5 to 7, ascending and nearly straight; petioles 1 cm long, grayish brown, glabrous, longitudinally ridged and grooved along the upper side, at the base expanded into an interaxillary saucer like gland. Flowers in small, subsessile and axillary clusters, ridgid and easily falling, glabrous; calyx greenish, corollas sulphureus, stigmas brown.

Type specimen number 16001, discovered by *A. D. E. Elmer* in a very dense humid flat of a depression at 2000

feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May 1916.

Number 16962 from this vicinity was also distributed under this new name, but in reality it is *Garcinia lateriflora Blm.*

Garcinia gynotrochoides Elm. n. sp.

An erect shrub or shrub like tree. Stems terete, grayish to brown mottled, the bark quite smooth; branches laxly spreading, freely rebranched; twigs very thin, terete, 3 mm thick, opposite, their young tips glabrous and more or less striately ridged, brownish. Leaves membranous, glabrous, obscurely punctate beneath but conspicuously so on the upper surface, entire, many, oppositely scattered, deciduous or easily becoming detached, lanceolate or narrowly oblong, variable in size, mainly obtuse at the base, gradually extended at the apex into caudate points, the larger blades 3.5 cm wide at the middle and 10 cm long, the smallest ones 2 by 7 cm, darker green above when fresh, when dry darker brown on the upper side; midrib narrowly ridged beneath and of the same lighter brown as the lower leaf surface, raised along the upper side, extended clear into the rounded tips of the slender apex: nerves 6 to 12 from each side of the midrib, inconspicuous, divaricate or nearly so, straight or slightly curved and parallel, their tips abruptly curved upwardly, cross bars or reticulations none; petioles also glabrous, blackish brown on my specimen, 5 to 10 mm long, broadly caniculate along the upper side and slightly expanded at the base. Flowers globose, 2 to 3 mm in diameter, in small or dense clusters, lateral or from the leaf axils or from the axils of leaf scars, all parts smooth and glabrous, umbellately scattered, persistent, numerous, yellowish in the fresh state, curing dark or dull brown; pedicels strict, varying from 4 to 8 mm in length, subtended at the base

by thick, rugose and brown colored bracteoles or bract vestiges; sepals rotund and spreading, petals elliptic and exceeding the calyx.

Type specimen number 15604, discovered by *A. D. E. Elmer* in secondary woods along stream banks at about 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

Our new species here described and published is a critical segregate from *Garcinia sulphurea Elm.* and *Garcinia samarensis Merr.*

ICACINACEAE

Gomphandra sorsogonensis Elm. n. sp.

A laxly branched undershrub. Branchlets slender, glabrous or only slightly puberulent at the young tips, often a trifle crooked, terete, 3 mm thick on my specimen, dull brown, ascending or widely spreading. Leaves oblong, submembranous, alternately and well scattered along the very slender twigs, flat, glabrous, entire, darker green on the upper side when fresh and curing darker brown on the same side, paler beneath when fresh and in the dry state, the larger blades 10 cm long by 4 cm wide across the middle or their widest portion, the smaller ones 2.75 by 6 cm in size without the petioles, obtuse to obtusely rounded at the base, apex short acute to acuminate; midrib darker brown beneath on the dry leaves, strict, conspicuous and narrowly caniculate along the upper surface, smooth and glabrous; nerves relatively inconspicuous beneath, 4 to 6 from each side of the midrib, straight from the base but ascendingly arched toward their ends, darker brown than the leaf surface, also glabrous; reticulations very few if any and very faint; petioles averaging 1 cm long, thin, glabrate, finely grooved along the upper side, ascending, straight or curved. Young infructescence puber-

ulent but soon becoming glabrous, usually axillary, 1 to 2 cm long; peduncles ascending, mainly solitary, glabrate, from 5 to 10 mm in length, bearing at their distal ends a subumbellate cluster of from a few to several pedicelled fruits; pedicels frequently recurved, equalling the peduncles, glabrate; drupes obovate in general outline, 7.5 mm long, subterete or compressed on our specimen, narrowed toward the base, the rounded top very rugose and brown in color, otherwise black, usually subtended by a persistent cupular calyx.

Type specimen number 15295, discovered by *A. D. E. Elmer* in woodlands, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, December 1915.

Numbers 15295 and 16429 were both distributed as *Urandra sorsogonensis Elm.* Now, I consider the latter number as *Gomphandra cumingiana* (*Miers*) *Vill.*, while only the former number is here described as a new species of *Gomphandra.*

Sarcostigma surigaoensis Elm. n. sp.

Scandent shrub or a heavy looping climber. Stem subterete, 7 to 10 cm thick, crooked, branched toward the top and forming hanging masses; wood very soft, coarsely porous, yellowish or yellow in the center, watery, with a large whitish pith; bark gray to brown, smooth, green beneath the epidermis, relatively thin; branches divaricate, laxly rebranched, also crooked, the free ends pendant; twigs lax and very slender, terete, glabrous, light tan colored when dry. Leaves alternate and widely scattered along the branchlets, chartaceous, descending, shallowly folded upon the upper surface and recurved toward the blunt or sharply pointed apex, much paler green beneath, entire, glabrous and grayish green on both sides but especially so beneath when dry, base obtusely to broadly rounded, the larger blades 9 cm wide below the middle

and 2 dm in length, the smaller ones 6 by 12 cm, ovate to ovately oblong; midrib beneath yellowish in the fresh and dry states, plane and green on the upper side, ridged beneath, glabrous, extending clear into the short and blunt acumen; nerves 4 to 6 on each side, mainly from below the middle toward the base, more evident on the lower surface and paler yellowish brown, ascendingly curved; cross bars quite numerous, crookedly anastomosing, the fine reticulations equally prominent on both sides; petioles usually curved or twisted, thick, dull yellowish brown and longitudinally ridged or wrinkled, 2.5 to 4 cm long, leaving raised elliptic chalky white scars after falling. Panicle terminal or lateral and axillary, descending, flexible, pale green, glabrate, curing yellowish brown, from 3 to 6 dm long, the thin branchlets alternating and well scattered; flowers minute, mostly clustered at or toward the ends of the ultimate branches, deciduous, yellowish, the anthers bright yellow. Drupes dark green, ellipsoid or subglobose but usually somewhat compressed, 1-seeded, 3 cm thick, blackish brown when dry, surface strongly and irregularly wrinkled; seed smooth.

Type specimen numbers 13732 in flowers and 13930 in fruit, discovered by *A. D. E. Elmer* upon a wind swept forested ridge at 3500 feet altitude, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September 1912.

Evidently related to *Sarcostigma philippinensis Merr.* from Leyte and which is the only other species known from our archipelago. Our leaves are much larger and with broadly rounded bases.

LAURACEAE

Actinodaphne copelandii Elm. n. sp.

A small tree. Stem 2.5 dm in diameter, 8 m high, chiefly branched at the top, subterete, crooked; wood soft,

yellowish, the small central portion murinus; bark relatively thick, dirty brown and roughened with excrescences, the interior portion isabellinus; main branches crookedly rebranched; twigs terete, few and widely spreading, densely dull brown tomentose, the apical or younger portion obscurely angular or longitudinally ridged. Leaves entire, chartaceous, glaucous green beneath, horizontal, flat but with abruptly recurved tips, verticellate on our specimen, 3 in the whorl, the larger blades 12 cm wide near to the top, 25 cm long, the other mature leaves slightly smaller, distinctly tapering toward the obtuse or subcuneate base, the apex broadly rounded and terminated into an abruptly and sharply acuminate point which is often curved to one side, shining on the upper face even in the dry state and minutely punctate, not reticulate, beneath much lighter in color or subglaucous, finely or sparingly pubescent except the midrib and nerves; midrib very stout beneath, straight, ferruginous tomentose, flat and glabrate on the upper surface, when mature; cross bars numerous, very prominent and pubescent beneath, faintly impressed but glabrous on the upper side; petioles 2 to 5 cm long, also densly ferruginous pubescent, when old becoming glabrate, very thick, compressed or grooved along the upper side. Flowers densely clustered from the leaf axils or laterally scattered, usually upon very short reddish brown hairy peduncles which are subtended by bract vestiges; pedicels very short, similarly pubescent; the outer floral organs strigosely hairy on their dorsal sides, the inner organs yellowish.

Type specimen number 15994, discovered by *A. D. E. Elmer* in moist humus covered soil of steep wooded mountain flanks at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May 1916.

Quite distinct from *Actinodaphne conferta Merr.*, which is in fruit and was collected in the same province. Here again, we are waiting for the flowers of one type and

the fruits of another type to be collected for comparison. Our specimens were distributed as a species of *Neolitsea*. Named after *E. B. Copeland.*

Cryptocarya foxworthyi Elm. n. sp.

A small or little sized tree. Trunk 15 dm thick, 8 m high; wood hard or moderately hard, covered with checked and grayish brown blotched bark; main branches chiefly toward the top, ascending, numerously rebranched, covered with nearly smooth bark; branchlets erect or ascending, alternate, the ultimate ones rather thin and comparatively short, brown and terete; the twigs densely covered with a rubiginous pubescence, more or less clustered toward the ends of the branches, leaf bearing along their entire lengths, reddish brown tomentose, the young parts obscurely ridged longitudinally. Leaves numerous, subchartaceous, alternate and evenly scattered, ascending, flat, persistent, elliptic to oblongish, sometimes orbicular, the entire margins slightly involute, our largest blades 3 by 5 cm, most of them smaller especially the terminal ones, widest across the middle, rounded toward the top and abruptly terminated into a short but sharply acute point, base broadly obtuse to rounded, curing grayish brown on the upper side, ferruginous brown beneath especially the younger terminal ones, upper side glabrate except the nerves and midrib, lower side puberulent; petioles 1 cm long or shorter, thick, shallowly grooved along the upper side, also densely ferruginous pubescent; midrib stout and very conspicuous beneath, ferruginous tomentose, strict, the sunken upper side filled with similarly colored hairs; nerves parallel and ascendingly curved toward their distal ends, relatively prominent and similar in pubescence, impressed on the upper surface, 4 or 5 on each side of the midrib; cross bars none; reticulations minute or dense, more evident from the lower side, puberulent beneath, glabrate above. Inflorescence terminal, erect or ascend-

ing, densely reddish brown tomentose, varying from 2 to 5 cm in length, racemose or narrowly paniculate, subtended by reduced leaves, equalling the foliage or scarcely exceeding it, short branched from the middle or below the middle; flowers clustered from the ends of the short and stout branchlets, sessile, subtended by minute bracts or bract vestiges, about 3 mm long, narrowed at the base, the outer floral organs grayish brown pubescent. The young fruit similarly pubescent or otherwise glabrous, 1 cm in diameter, globular.

Type specimen number 17330, discovered by *A. D. E. Elmer* in alpine woods at 4000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

Apparently related to *Cryptocarya parvifolia Merr.* from Leyte, yet very distinct. It may more properly belong to some other genus, say *Machilus.* Named after *F. W. Foxworthy.*

Cryptocarya pacifica Elm. n. sp.

A medium sized tree. Trunk 2 to 3 or more dm in diameter; primary branches long, spreading, freely rebranched, the ultimate ones rather slender; twigs terete, quite smooth and glabrate, drying dark brown. Leaves not numerous, alternate from the distal ends of the branchlets, flat or somewhat recurved at the apex and folded toward the base which is broadly or truncately rounded, base of the smallest leaves obtusely rounded and a trifle inequilateral, the larger laminae ovately oblong, those of the smaller ones lanceolately oblong, our largest blades 10 cm wide a trifle below the middle, 25 cm long, gradually tapering into the sharply acute to subacuminate apex, entire, glabrous on both sides, curing lighter brown beneath; petioles 1 to 1.5 cm long, very thick, brown, wrinkled or scaly, flattened along the upper side; midrib bold beneath, caniculate along the upper side of the blade,

glabrous, slightly curved and often dividing the lamina into two unequal halves, brown when dry; nerves 6 to 10, conspicuous beneath, plane above, also glabrous and of the same color, ascending, more curved toward their distal ends; cross bars few and rather faint, reticulations fine, quite evident from the lower surface. Infructescence 1 to 2 dm in length, terminal or from the uppermost leaf axils, erect or ascending, paniculately branched from the middle or from below it; branchlets also ascending, alternate, short rebranched from their distal ends, the younger portions very finely gray pubescent, the older portions turning cinnamon brown. Fruits more or less clustered from the ends of the branchlets, upon very short to 1 cm long pedicels, ellipsoid, 1.5 cm long on my dried specimen, obscurely striate, pulverulent or puberulent, the young ones with a short and blunt cinereous point.

Type specimen number 16758, discovered by *A. D. E. Elmer* in dense forests facing the Pacific ocean at about 2500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July to August 1916.

Cryptocarya zamboangensis Merr., but our leaves are much larger, broadly rounded at the base and sharply pointed at the apex. The petioles, midrib and nerves on our specimens are entirely glabrous.

Cryptocarya trinervia Elm. n. sp.

A small to medium sized tree. Stem 2 dm thick, 8 m high, with numerous branches from the middle; main branches spreading, numerously rebranched toward their ends; twigs terete, smooth, gray, the green apical portions glabrous. Leaves very numerous, alternate, subpersistent but leaving roughened scars after falling, glabrous, entire, usually flat toward the obtuse to obtusely rounded bases, apex much recurved and rather abruptly acute to acuminate, the average blades 7.5 cm long, 3 cm wide across the

middle but often smaller, curing blackish brown on the upper surface, tan color beneath, coriaceous, apparently much darker and sublucid green on the upper side when fresh; midrib conspicuous beneath and reddish brown, narrowly caniculate along the upper side of the blade, glabrous and smooth; nerves of one pair arising from the base of the leaf or very near it, ascendingly curved submarginally, secondary nerves none or very obscure, no cross bars in evidence; petioles slender, from 5 to 15 mm in length, somewhat compressed along the upper side, nearly black when dry. Inflorescence glabrous, terminal, lateral or axillary, erect or ascending, 2 to 5 cm long, branched from near the base, the short peduncle and all the comparatively short branches drying black; flowers upon short pedicels which are either straight or recurved, alternately scattered; the turbinate calyx subtended by apiculate bracts, coriaceous and glabrous, the inner florets only slightly strigose.

Type specimen numbers 17395 and 16749, discovered by *A. D. E. Elmer* in wooded ravines of the higher altitudes, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July to September 1916.

Our specimens have not the facies of *Cryptocarya cinnamomifolia Merr.* My Bornean specimen, so determined, has ovoid to ellipsoid fruits, 2.5 to 3.5 cm thick or long, yellowish red to a deep purple and only faintly ribbed. The fruits of our Philippine types are as yet unknown, and it will be interesting to have them for comparison.

Litsea bulusanensis Elm. n. sp.

An erect shrub or little tree. Branchlets terete, slender, the older portions glabrous, dull brown when dry, sprinkled with light colored lenticels, the young ultimate ones smooth and more or less angular, entirely glabrous,

slender. Leaves subpersistent, erect or ascending, flat, entire, acute at the base or subcuneate, gradually extended into the acute to subacuminate apex, alternately crowded toward the ends of the twigs, leaving circular and whitish scars after falling, much paler green beneath when fresh and drying lighter brown on the lower surface, narrowly oblong, our largest blades measure 5 by 15 cm, often smaller, widest across the middle, subcoriaceous; midrib darker reddish brown beneath, prominent clear into the apex, plane on the upper side of the blade; nerves 5 to 7 on each side of the midrib, much ascending and curved, not evident on the upper side; cross bars none, but with fine reticulations on the lower surface; petioles subterete, stout, up to 2 cm in length, glabrous, drying blackish brown, more or less flattened along the upper side. Young infructescence lateral or arising from the axils of the leaf scars, upon pedunculate glomerules; pedicels glabrate or puberulent, stout, strict, up to 1 cm long, bearing at their distal ends one to several sessile fruits, slightly thickened at both ends and subtended by thick bract vestiges; fruits 5 to 7.5 mm long, sessile and subtended by light brown involucral bract vestiges, the basal half turbinate and subterete, the upper portion rounded and much thicker, more or less scale covered except the brown pubescent top, terminated by a circle of persistent floral bracts which are grayish brown pubescent on the exterior.

Type specimen number 16792, discovered by *A. D. E. Elmer* in the woods at middle altitudes, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July 1916.

My number 15557 and a half dozen of other similar specimens from Irosin are identified as *Litsea luzonica (Blm.) Vill.* By comparison our present new species is different. The shape and size of our leaves would throw 16792 nearer to *Litsea fulva* of the same authors, but they

are not "fulvo-tomentose" along the branches and on the lower side of the leaves. Notice the peculiar fruits on our type specimen being glomerated upon distinct peduncles.

LEGUMINOSAE

Mezoneurum cabadbarense Elm. n. sp.

A lofty tree climber. Stem hanging or looping, 12 cm thick, widely branched at the top; main branchlets likewise widely scattered; wood very soft or pulpy, porous, the sappy white portion gradually changing into a rusty brown color; bark thick, blackish brown except the testaceus inner portion, lenticelled or excrescent on the old bark; twigs glaucous green, very smooth, the younger parts ferruginous pubescent, grooved along the sides, tough, dark brown when dry, 1 cm thick more or less. Leaf bearing stalks alternately scattered, densely yellowish brown ferruginous, 2 dm long on my specimen, recurved and provided with short but sharply pointed recurved spines, at the base bearing a pair of large irregularly bilobed bracts which are punctate beneath, gradually compressed toward the base; the leaf bearing rachis alternate and divaricate, very slender, averaging 5 cm long, densely pubescent to glabrate; leaflets deciduous, 1.5 to 2 cm long or even smaller, .75 to 1 cm wide, membranous, elliptic with bluntly rounded ends, the base slightly inequilateral and with a very short tomentose petiole, paler beneath in the fresh and dry states, olivaceus green when dry, minutely punctate beneath, without nerves or reticulations; midrib rather faint, reddish brown hairy on the lower side toward the base, glabrous on the upper surface. Spikes on my specimen 25 to 30 cm long but which is only a part of the meter long panicle with red branches, flower bearing from below the middle, more or less hairy, subterete, reddish brown when dry, axillary, erect or ascending; pedicels

alternate or in subwhorls, glabrate, 3 cm long, subtended by deciduous linear to lanceolate bracts and bearing a single terminal flower.

Type specimen number 13386, discovered by *A. D. E. Elmer* in wet rocky soil of densely humid woods at 1250 feet altitude, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, July 1912.

Differs from *Mezoneurum latisiliquum* (*Cav.*) *Merr.* in a number of important characters. There may have occurred a mixture in the distribution of this number.

LINACEAE

Ixonanthes philippinense Elm. n. sp.

A small tree or an erect shrub. Branches rigid, terete or the young apical portion of the twigs angular, smooth and glabrous, dark reddish brown when dry, the branchlets erect or ascending. Leaves similarly disposed, flat or conduplicate, glabrous, sublucid and darker green on the upper surface, entire, curing unequally dark brown, the smaller blades 8 to 14 cm long, from 3.5 to 6 cm in width above the middle and 14 cm in length, obovately oblong or only obovate, apex rounded and foldingly recurved at least appearing so on my dried specimen, base cuneate, alternately scattered but usually crowded toward the distal ends of the branchlets, much lighter brown beneath; midrib ridged beneath, caniculate above, smooth and glabrous, dark or very dull brown; nerves 6 to 10 on each side, with a few intermediary ones, ascending, slightly curved but their ends more ascendingly curved and reticulately united, comparatively inconspicuous, equally evident from both sides, light brown as the lower leaf surface; reticulations obscure but equally visible from both surfaces, rather coarse; petioles 1.5 cm long, stout, glabrous, reddish dark brown to black, caniculate along the

upper side, a trifle enlarged toward the base, usually straight, leaving small scars after falling. Infructescence mostly from the leaf axils, ascending, strict, up to 12 cm long, entirely glabrous, short branched and fruit bearing at the distal end; peduncle about 8 cm long, subterete, enlarged at the base, dark vinosus on our dry specimen, obscurely compressed at the terminal end; branches usually in opposite pairs, divaricate and ascending, also strict, similarly colored, obscurely compressed, 1.5 cm long; secondary branches much shorter, 2-branched at their ends; pedicels short but thick, glabrous; calyx or perianth persistent, 5 to 8 mm across the saucer shaped cup, leather brown and thick, rigid, the inner whorl of segments twice as long as the lower or basal whorl. Capsule 2 cm long, blunt at both ends, severally or numerously carinate, dark leather brown, dehiscing from apex toward the base, the inner sides of the carpels much lighter brown.

Type specimen number 17234, discovered by *A. D. E. Elmer* in dry woods at about 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

Apparently nearest allied to *Ixonanthes reticulata Jack*, but our capsules are only one half as long. Number 530 collected by a native in Borneo is in fruit and appears very similar to our plant.

LOGANIACEAE

Fagraea cardinalicarpa Elm. n. sp.

An epiphytic shrub in the crotches of large limbs of a *Dipterocarpaceae*. Stem or stems a meter long or longer, few branched; the twigs relatively short, mostly terminal, terete, grayish to brown, longitudinally wrinkled when dry, 5 to 8 mm thick, glabrous clear to the greenish tips. Leaves leathery, opposite, subpersistent, leaving large orbicular

and grayish white scars after falling, smooth and glabrous, lanceolately oblong or narrowly oblong in the smaller ones, ascending or erect, flat, only the tips slightly recurved, entire, the darker green upper sublucid surface curing blackish brown, paler beneath in the fresh state and dark brown when dry, the margins usually subinvolute toward the obtuse or obtusely rounded base which in the largest blades is often a trifle inequilateral, gradually terminated into the acuminate apex, averaging 12 cm long without the petiole, 3.5 to 4.5 cm in width at or below the middle, appearing somewhat wrinkled on both sides; midrib pronounced on both sides, comparatively black on my specimen; nerves scarcely evident, ascending, tips upwardly curved, 5 to 8; cross bars or reticulations absent; petioles also black, smooth and glabrous as the midrib, stout, 1.5 to 2.5 cm long, flattened along the upper side, apparently provided by thick and shortly pointed interaxillary bracts. Fruit axillary or lateral, ellipsoid, upon a very short and thick stalk, my dried and pressed specimen from 5 to 8 cm long and about 4 cm thick, rounded at both ends, the base subtended by a short whorl of involucral thick bracts, hard and rigid, shining cardinal red, black when dry; the numerously crowded and irregularly compressed seeds reddish.

Type specimen number 15492, discovered by *A. D. E. Elmer* upon a large forest tree at 3500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

Originally it was considered a species of *Theaceae*. Only a single plant was found and only one specimen with fruit was obtained which is retained in my type collection.

MENISPERMACEAE

Tinospora hastata Elm. n. sp.

A climbing as well as twining undershrub. Stem terete, flexible, as thick as a slate pencil, covered with

brown more or less smooth or lenticelled bark; branches green, long and slender, curved, longitudinally fluted, otherwise smooth and glabrous, rather tough or wiry, 2 mm thick and greenish gray on my dried specimen. Leaves widely scattered along the stem and branchlets, alternate, membranous or thinly chartaceous, mostly ascending or horizontally spreading, the older ones descending, entire, flat or tips recurved, paler green beneath when fresh, drying green but much paler beneath, glabrous, triangular in outline, our larger blades 15 cm long by 8 cm wide across the hastate base which has a wide sinus and a pair of basal lobes extending outwardly and terminated by a sharp point, the smaller leaves measure 5 by 10 cm, all gradually tapering toward the sharply acuminate to setaceous apex; midrib straight from base to apex, quite evident from beneath but obscure on the upper side, yellowish brown and sparsely ciliate especially toward the base; nerves with 2 pairs arising from the base and ascendingly curved, the smaller basal pair running into the hastate lobes and usually are short rebranched, the upper pair with one or two secondary nerves on the outer side, besides these basal nerves there is 1 or 2 pair of obscure nerves arising from the midrib above the middle of the leaf, minutely ciliate beneath; cross bars or reticulations obscure or obsolete; petiole 5 to 8 cm long, green, ascending, straight, curved and twisted or rather enlarged at both ends especially at or toward the base, caniculate along the upper side, very slightly hairy. Infructescence cauline, pendant, the peduncle and rachis very slender, also green, 2 dm long, short branched from above the middle, the branchlets and 1 cm long pedicels puberulent, thickened at the base; fruit ellipsoid, nearly 1 cm long, glaucous green but pale roseus when fully ripe.

Type specimen number 16960, discovered by *A. D. E. Elmer* in a steep densely wooded ravine at 1000 feet al-

titude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

It is not *Tinospora negrotica Diels.*

MORACEAE

Ficus agusanensis Elm. n. sp.

A suberect shrub or small tree. Stem 1 dm thick, terete, 3 to 5 m high, branched from below the middle; wood white, soft and pulpy, with a large pith; bark grayish green, smooth, brownish except the epidermis, containing latex; branchlets lax, widely spreading; twigs descending but with ascendingly curved leaf bearing tips, 5 mm thick, glabrous and yellowish brown in the dry state, terete. Leaves alternately crowded and terminal, very smooth, ascending or more spreading, nearly flat, apices abruptly and strongly recurved, much paler green beneath, diverse in size, glabrous, subchartaceous to submembranous, entire, oblong, frequently a trifle inequilateral below the middle, apex abruptly terminating into a rather sharply acute or subacuminate point, base broadly obtuse to rounded, occasionally slightly inequilateral, oblong, up to 18 cm long without the petioles, one half as wide across the middle, my smallest blades are 12 cm long by 5 cm wide, curing copper brown beneath, dull gray on the upper surface, densely light brown punctate beneath; midrib very pronounced and reddish brown beneath, also glabrous; nerves 5 or 6 on each side, relatively prominent and similar in color on the lower side, ascending, the basal pair arising from near the base and running submarginally, tips of the upper nerves interarching; cross bars quite evident or conspicuous on the lower face, reticulations obscure; petioles slender, up to 5 cm long, caniculate along the upper side, otherwise striate, glabrate, brown when dry; bud bracts

1 cm long, sharply pointed, grayish on the exterior. Infructescence of short woody tubercles along the larger branches; receptacles obovoidly globose, soft and nearly 2.5 cm in diameter when fresh, glabrous, much wrinkled when dry, slenderly stipitate, upon 1 to 2 cm long pedicels.

Type specimen number 13593, discovered by *A. D. E. Elmer* among bowlders of the Catangan creek cut at 1500 feet altitude, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August 1912.

Although originally distributed as *Ficus integrifolia Elm.*, it really seems specifically distinct from it as well as from *Ficus paucinervia Merr.*

MYRISTICACEAE

Horsfieldia gigantifolia Elm. n. sp.

A large or medium sized tree. Trunk 6 dm in diameter, terete and crooked, 10 m high or higher, branched from above the middle; main branches spreading, also crooked, rebranched toward their ends and from above the middle; wood moderately hard, whitish but slightly tinged with red toward the center; bark relatively thick and brownish on the trunk, smooth and gray mottled on the branches; twigs or branchlets few, thick, mainly horizontal or the younger ones ascending, comparatively long, terete, roughened by coarse lenticels, cinnamon brown, the ultimate portion rather thin and reddish brown puberulent. Leaves few, alternate, glabrate, entire, oblong, up to 4 dm long by 1.5 dm wide or occasionally smaller, oblong, coriaceous, broadly obtuse or obtusely rounded at the base, at the apex gradually or abruptly tapering into a sharply acuminate point, curing grayish beneath, brownish above; midrib stout and raised beneath, plane above, yellowish brown beneath on my specimen, glabrous or nearly

so when old; nerves 18 to 20 on each side of the midrib, divaricate, subparallel with tips ascendingly curved, similarly colored beneath, much less prominent yet quite conspicuous on the lower side, cross bars and reticulations obsolete; petioles 2 cm long or shorter, very thick, blackish brown, flattened and grooved along the upper side, puberulent to glabrate. Inflorescence lateral, yellowish brown, 5 cm long on my specimen but apparently much longer on other specimens, quite rigid, puberulent to subglabrous, paniculately branched from near the base, all the branches, including the main stalk short and very thick. Fruits short ellipsoid, 2 cm long, brown and minutely verrucose, dehiscing from the apex down along the lateral sides, with a large solitary seed.

Type specimen number 17220, discovered by *A. D. E. Elmer* in densely sheltered forests at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

MYRSINACEAE

Ardisia peninsula Elm. n. sp.

A suberect shrub or little tree. Main branches spreading, rebranched; branchlets terete, glabrous or puberulent toward their ends, yellowish brown in the dry state, the twigs 5 mm thick. Leaves alternate, ascending, mostly flat or some of the them conduplicate and with recurved tips, entire, submembranous or subcoriaceous, lanceolately oblong, darker green on the upper side when fresh and curing dull brown, beneath lighter brown or copper colored, blades 16 cm long by 5 cm wide across the middle or just below the middle, very gradually tapering to the slenderly acuminate apex, base obtuse to subcuneate; midrib raised beneath, stout toward the base, rather straight from base to apex, glabrous or slightly brown hairy along its

sides toward the base beneath, copper brown, upper side narrowly caniculate; nerves very faint, 12 or more on each side of the midrib and with a few secondary nerves in between toward the base, ascendingly curved toward their very obscure tips; cross bars or reticulations not evident; petioles stout, flat or grooved along the upper side, dull brown, wrinkled longitudinally, thickened toward or at the base, averaging 1.5 cm long, glabrate. Flowers clustered in the upper leaf axils, brown, slightly ferruginous puberulent, upon very short and thick pedunculate stalks; pedicels several and arising terminally from the stout peduncles, 5 mm long more or less, straight or curved, puberulent, subtended by bract vestiges, widely scattered, exceeding the peduncles or twice as long; calyx very short and roundly apiculate, 5, persistent, puberulent; corolla much longer. Fruit spherical, 5 mm in diameter, brown on my specimen, smooth, short mucronate at the apex, upon recurved pedicels and subtended by the star shaped calyx.

Type specimen number 16615, discovered by *A. D. E. Elmer* in light woods at 1000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July 1916.

Ours is distinct from although closely related to *Ardisia cuprea Elm., Ardisia disticha A. DC.* and *Ardisia tomentosa Presl.* Neither is our specimen matched by 1467 *Cuming,* a cotype of *Ardisia philippinensis A. DC.*

Maesa irosinensis Elm. n. sp.

A suberect shrub. Main branches long, slender, rebranched, smooth, brown; branchlets terete, brownish on my specimen and densely beset with lighter colored lenticels, 5 mm thick, straight, ultimately finely rebranched; twigs glabrous, also lenticelled, longitudinally wrinkled when dry. Leaves widely scattered along the larger branchlets, ascending or horizontal or even descending, flat, the

larger blades ovately elliptic, gradually terminated by acute apices, entire, the normal ones 12 to 15 cm long by 8 cm wide below the middle, broadly rounded at the base, when dry castaneus beneath and grayish on the upper side, submembranous or subcoriaceous, totally glabrous, those leaves toward the ends of the flower bearing twigs much smaller in size and also different in shape, elliptic to oblongish, on my specimen varying from 3 to 9 cm long and 2 to 4 cm wide across the middle, all more or less persistent; midrib prominent and castaneus beneath, glabrous, conspicuous and grooved on the upper side especially toward the base; nerves 4 to 6 but usually only 5 on each side of the midrib, quite evident from both sides of the leaf, ascending from near the base, ascendingly curved toward their distal ends which become very obscure, those of the smaller leaves with only 3 or 4 nerves, cross bars or reticulations none or obsolete; petioles varying from 1.5 to 2.5 cm long, dark brown, caniculate along the upper side, slightly enlarged toward the base. Inflorescence terminal and axillary, erect or ascending, glabrous, curing brown, up to 7.5 cm in length, sometimes only 2 cm in length, the longer stalks with few alternating branches arising from below the middle, the shorter stalks are mostly unbranched. Flowers or fruits regularly scattered from below the middle of the solitary or branched stalks; pedicels subtended by minutely subulate bracts, 3 to 4 mm in length, ascending or curved, alternate, leaving roughened light colored scars after falling; calyx turbinate toward the base, the short and free lobes rounded at their apices.

Type specimen number 15558, discovered by *A. D. E. Elmer* in shrubberies along streams at low altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

This number is cited in the Enumeration under *Maesa longipetiolata Merr.*, but in fact it is more closely allied

to *Maesa plàtyphyllá Elm.*, from which it differs in a number of specific characters. And again, our leaves are similar to those on *Maesa undulàta Merr.* and to *Maesa megaphylla* of the same author, but our flowers and inflorescence are very different.

MYRTACEAE

Eugenia irosinensis Elm. n. sp.

A small or medium sized tree. Stem 3 dm in diameter, crooked, about 8 m high, crookedly rebranched toward the top; main branches spreading, freely rebranched toward their ends; branchlets smooth, terete, gray; the leaf bearing twigs very smooth, slender, also gray in color, glabrous, terete except at the leaf attachment where it is conspicuously compressed. Leaves numerous and persistent, slightly paler green beneath, curing nearly equally brown on both sides, mostly horizontal, flat or occasionally folded and recurved, the average blades ovate in shape, the terminal ones broadly lanceolate, the basal ones smaller in size and elliptic in shape, entire, gradually tapering to the sharply acute to acuminate apex, base broadly obtuse for the narrower blades, most of them broadly to truncately rounded at the base, the larger ones 9 cm long by 6 cm wide at or below the middle, the terminal ones narrower, opposite, well scattered, subchartaceous, entirely glabrous; midrib stout, prominent toward the base, glabrous, darker brown when dry, narrowly grooved on the upper leaf surface; nerves 4 or mostly 5 on each side of the midrib, ascending, their tips much ascendingly curved, less prominent, cross bars and reticulations few and obscure; petioles relatively thick, 3 to 5 mm long, ascendingly curved, glabrate, very dark brown on my specimen, widely grooved along the upper side toward the leaf base. Infructescence terminal or from the terminal leaf axils, erect or ascending, upon 2 to 5 cm long stout stalks, few and very short branched,

sometimes this main stalk is longer or very short; fruits upon 1.5 cm long pedicels or subsessilely attached to the main axis, bowl shaped, truncately rimmed at the deeply sunken top, rounded at the base, 1.5 cm high, nearly as wide across the top.

Type specimen numbers 15600 and 15274, discovered by *A. D. E. Elmer* in woodlands of middle altitudes, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November and December 1915.

Related to *Eugenia balerensis C. B. Rob.*

Eugenia obliquinervia Elm. n. sp.

An erect large tree. Bole terete, 6 dm in diameter, 18 m high, chiefly branched toward the top; wood dingy white on the outside, rather hard; bark smooth and grayish white mottled; main branches comparatively short and forming a more or less of an elongated crown, rebranched; twigs gray or yellowish gray, thick, their thin ultimate portion glabrous. Leaves also glabrous, subchartaceous, horizontal or descending, somewhat folded and recurved, dark green and very lucid on the upper side, opposite, entire, lighter green beneath, shining and blackish brown on the upper side when dry, tan colored beneath, lanceolately oblong, 12 cm long without the petioles, 4.5 cm wide across the middle, often smaller in size, gradually tapering into the subacuminate apex, base wedge shaped, occasionally obtuse; midrib pronounced beneath, brown and glabrate, channelled along the upper surface, strict; nerves 4 to 6 on each side of the midrib, very oblique, quite evident on the upper side, prominent toward the base but the ascendingly curved tips scarcely united, cross bars with reticulations more evident from the upper side; petioles ascendingly curved, 1.5 cm long, deeply caniculate along the upper side, glabrous, brownish black and much wrinkled in the dry state. Infructescence from the terminal

ends of much thickened stalks or special main branchlets; its few branches terminal, 2 to 4 cm long, also thick and crooked, persistent, bearing the large fruits at their ends; ripe fruits hanging, shining green when collected, 3 to 4 cm long, 2.5 cm thick, ellipsoid, sometimes slightly curved, the circularly sunken apex somewhat oblique, with obscure longitudinal lines or ridges from the base to the apex; rind thick, the inner portion white and soft or mealy; seed ellipsoid, 2.5 cm long, vegetable like and similar in texture.

Type specimen number 16117, discovered by *A. D. E. Elmer* in wooded ravines of the upper hemp fields at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, May 1916.

Eugenia peninsula Elm. n. sp.

A medium sized tree. Trunk 3 dm in diameter, 10 m high, chiefly branched at or toward the top, subterete and crooked; wood dingy white, odorless, hard, covered with smooth yellowish brown bark; main branches spreading, crookedly rebranched, terete, brown to gray; twigs many, very slender and lax, glabrous, the ultimate portions compressed and yellowish gray. Leaves copious, submembranous, opposite, chiefly horizontal, entire, mostly oblong but sometimes lanceolate in shape, paler green beneath, curing similarly brown on both sides, glabrous, minutely black punctate on the upper surface only, 3 to 4 cm wide across the middle, 8 to 12 cm long but occasionally up to 15 cm in length, rounded toward the top and terminated into an abrupt and sharply acute to acuminate point, more tapering toward the obtuse to subcuneate base from the middle of the blades, flat but frequently conduplicate, persistent; midrib pronounced beneath, channelled on the upper surface, brown, glabrate; nerves faint, 7 to 9 on each side, ascending, strict, subparallel, their tips interarching and forming a submarginal vein, reticulations

scarcely visible; petioles 5 to 15 mm long, blackish brown, glabrate, caniculate along the upper side. Inflorescent branches green and slender, up to 1 dm long but most of them considerably shorter, laterally grouped or terminal and single, glabrous, dirty brown when dry; pedicels opposite or ternate, strictly ascending, arising from near the base, varying from 1 to 3 cm in length; calyx over 1 cm long, fully as wide across the expanded top, turbinate, glabrous, constricted at the base; petals clavate, the ovately orbicular limb densely glandular on the exterior; stamens much exceeding the corolla, numerous, their filaments flattened toward the base, anthers small and versatile. Fruits ovoidly globose, nearly 1.5 cm in diameter, with calyx segments strongly curved inwardly into the cavity, whitish but the exposed portion pink.

Type specimen numbers 15991, 15421, 15968 and 15441, discovered by *A. D. E. Elmer* in wet stony ground of wooded ravines and in other secondary forests at about 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915 and May 1916.

To be compared with *Eugenia tripinnata (Blco.) C. B. Rob.* and *Eugenia luzonensis Merr.*

OLACACEAE

Strombosia minor Elm. n. sp.

A small erect tree. Stem terete, branched from above the middle, about 2 dm thick. Main branches ascending or divaricate, numerously rebranched toward their ends; twigs many, mainly ascendingly curved, glabrous, terete but conspicuously roughened by the old leaf scars, very slender or thin but rather short, the ultimate ones usually short rebranched. Leaves numerous, alternating in closely set subdistichous rows, persistent, strongly conduplicate and recurved, coriaceous, glabrous, entire, gradually ta-

pering to the acute to acuminate apex, sometimes abruptly pointed, base obtuse, the average blades 6 cm long by one half as wide across the middle or below it, sometimes larger but more often smaller, the folded leaves usually appearing falcate, broadly lanceolate or short oblong, curing dirty or grayish brown on both sides; midrib quite evident beneath, straight in the flat leaves, curved on the folded and curved blades, light brown and glabrous on the lower surface, plane above; nerves 3 to 4 from each side of the midrib, much ascendingly curved, also evident from the upper surface; petioles mostly 1 cm long, occasionally up to 1.5 cm in length, slender, subterete, blackish brown on my specimen, minutely verruculose when dry, ascending or divaricate, closely set and alternate, straight, subpersistent, leaving raised scars after falling. Flowers single or few clustered from the leaf axils or from the axils of their scars, greenish white, glabrous, ascending; pedicels very short, subtended at the base by a whorl of short and grayish to brownish involucral bracts; calyx also short, its toothed segments spreading; petals much longer.

Type specimen number 14866, discovered by *A. D. E. Elmer* in dry woods at medium altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

This is the second species of this genus known from our archipelago, and is primarily distinguished from *Strombosia philippinensis (Baill.) Rolfe* by its more numerous branchlets, more numerous and smaller leaves. The number cited in the Enumeration is wrong.

PANDANACEAE

Freycinetia brevifolia Elm. n. sp.

A scandent shrub. Stem 1 cm thick toward the distal end, terete, climbing along stems of inclining trees, occasionally branched, dark green, smooth, glabrous, becom-

ing longitudinally wrinkled upon drying; branchlets long, rigid, tough, the lower side more or less provided with greenish wire rootlets which are tightly fastened to their support. Leaves normally in three rows especially toward the free tips, toward the base appearing distichous or in two alternating rows, those at the distal end paler and densely folded one upon another; the green blades are ovately elliptic when flattened, brown and strongly recurved in the dry state, in the fresh state 2 cm wide across the middle or just below it and 2.5 cm long, with short acute and abruptly recurved tips, minutely and numerously white dotted beneath, curvingly folded upon the upper and much darker green surface, much recurved toward the apex which is often a trifle twisted to one side, the margins finely serrate from the base to the apex with needle like spinules, the upper surface is distinctly ridged by the nerves; sheath from 1 to 1.5 cm in length or as long as the ligule, light green and longitudinally striate with a pale green; nerves numerous from the base into the apex, curved and parallel; ligule subpersistent, dry, brown when old, also glabrous, fully 1.5 cm long by 7 mm wide, oblong in general outline, nearly of the same width throughout, truncately attached at the base, thinly membranous, obliquely rounded or subtruncate at the apex, attached to the sheath for the entire length, the free margins beset with soft ciliated spinules, the upper or young ones very pale green and softly membranous, the ciliae are of a yellowish brown color, finally becoming torn, lacerated and detached from the sheath.

Type specimen number 22692, discovered by *A. D. E. Elmer* upon the summit mountain ridge at about 3500 feet altitude, Camp Labi, Province of Nueva Ecija, Luzon, March 1937.

Flowers and fruits are not known of this species of *Freycinetia* with distinctively abbreviated leaves.

Freycinetia pandanicarpa Elm. n. sp.

A tree climber. Stems few but long branched, quite rigid. Leaves densely overlapping at their imbricate basis, chartaceous, numerous, erect or ascending, 5 dm long, 1.5 cm wide more or less, linearly tapering from below the middle to the very slender apex, the basal portion also gradually tapering and very strongly conduplicate, minutely and densely serrate along the margins, toward the base very sharply serrate or serrately dentate, flat except toward the base, drying light tan on both sides, apex exceedingly slender and more or less triangular at the very tip; midrib ridged or keeled and similarly serrate on the lower side except toward the base where it is nearly smooth, caniculate along the upper smooth side especially at the apical tip; lateral nerves numerous and more prominent on the lower surface, both sides smooth; sheaths up to 8 cm long, at the base very strongly or tightly folded upon one another, thick and rigid, the exterior portion shining reddish brown or turning blackish with age, smooth, the thin and entire marginal ligule linear and obtusely terminating at the apex of the sheath proper. Common peduncle erect, terminal, triangular, 1 to 1.5 cm thick, with conspicuous tranverse coarse markings; secondary peduncles also erect, smooth clear to the base of the cylindrical spikes, light brown, subterete or flat on the inner basal portion, 4 to 5 cm long on my specimen, usually 3-clustered; spikes up to 18 cm long or shorter, 2 cm thick when dry, straight or becoming recurved, densely set with drupes from the base to the apex; drupes curing dull brown, appearing subglaucous in the fresh state, the free apical portion angularly conical, its 4 or 5 sides flat and ridges between the faces scarcely evident, the apex irregularly rounded and truncate; stigmas 3 to 5. Seeds very numerous.

Type specimen number 13683, discovered by *A. D. E. Elmer* in the forests at medium altitudes, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, August 1912.

Freycinetia surigaoensis Elm. n. sp.

Shrubby and scandent, forming hanging interlaced masses. Stems loosely encircling its support, 1 to 1.5 cm thick, terete, crooked, ringed, repeatedly branched toward the top, very rigid and breaking with a snap; woody tissues yellowish, odorless and tasteless, covered with a smooth nearly castaneus bark; branchlets slender, curved and drooping, ultimately ascendingly curved; twigs thin, shining brown on my dry specimen, subterete or subangular, smooth and glabrous, conspicuously ringed at the leaf scars. Leaves very numerous, membranous, horizontal or descending, in the fresh state the upper surface appears shining and of a metallic green, paler beneath, the terminal or young ones very light or even yellowish green, the middle portion appearing rugose or obscurely undulate in the fresh and even in the dry states, closely set, alternate, entire except the few small spinescent teeth at the apex, flat, truncately rounded at the base, edges straight and gradually tapering from the base to the more or less blunt apical point, curing blackish brown on both sides, the lower surface appearing minutely spotted, my larger blades 3.5 cm long by 7.5 mm wide across the base, most of them average smaller; midvein usually provided with a few small teeth on the lower side especially at or near the apex; nerves equally seen from both sides, parallel from the base to apex; sheaths boot like, smooth, with a few longitudinal ridges; ligule thin, with long grayish white hairs or ciliae along the sides and top. Heads 3, terminal, pendant, globose, 2.25 cm in diameter, dark

green, red when fully mature; peduncles erect and ascending, slender, glabrous, subterete or more flattened at the basal upper portion, brown when dry, 1.25 cm long, subtended by the ordinary green foliage; drupes tan color at the blunt apex with the 3 to 5 stigmas.

Type specimen number 13725, discovered by *A. D. E. Elmer* in a very humid and densely wooded depression at 3500 feet altitude, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, September 1912.

It is a clear and distinct species, and falls in the group with *Freycinetia sphaerocephala Gaud.* and *Freycinetia jagorii Warb.*

Pandanus urdanetensis Elm. n. sp.

Apparently a low tree or tree like with proproots. Branches few, ascending. Leaves crowded from the ends of the branchlets, at first ascending but usually recurved from the middle or from below or from above the middle, linear, 7.5 cm wide for the entire length except the apical 3 to 4 dm long portion which is very gradually tapering into the acuminate and usually divided apex, the smooth and green upper surface more or less conduplicate especially toward the base, otherwise nearly flat but the lateral half of each of the blade is more or less descending, the median line of this section has an evident rounded incline on the upper side and a sunken depression on the lower side of the leaf, when dry light tan on the upper side, paler green beneath but glaucous white in the dry state, glabrous, 13 dm long on my specimen but no doubt longer clear to the base, edges short serrate for the whole length; midrib caniculate along the upper surface and smooth, keeled beneath and provided with well scattered apiculate serratures; nerves very fine and exceedingly numerous, obscure on the upper side, smooth. Drupes of the syncarps many, unequal in thickness, closely set, up to 3 cm in length,

tapering from base to near the apex, more or less angular and with flat contiguous sides for about 2 cm, the upper free portion angularly rounded, dull brown when dry but grayish toward the truncate stigmatic top; stigmas irregularly round or circular, brown, mostly about 5.

Type specimen number 13816, discovered by *A. D. E. Elmer* in woods or forests at medium altitude, Cabadbaran (Mt. Urdaneta), Province of Agusan, Mindanao, October 1912.

Our specimen may possibly be *Pandanus brevistipes Mart.*

POLYGALACEAE

Xanthophyllum flavo-virens Elm. n. sp.

Shrubby or tree like. Branches spreading and numerously rebranched; branchlets slender, also spreading, smooth and glabrous, ash colored on my dry specimen, occasionally obscurely lenticelled. Leaves alternate, widely scattered all along the more or less crooked twigs, chartaceous, glabrous, entire, much darker green on the upper side and pale or yellowish green on the lower side in the fresh state, curing very unequally on its two sides, flavus beneath and virescent above, our smallest blades lanceolate and 1.5 cm by 6 cm in size, the larger leaves narrowly oblong in shape, nearly 5 cm wide at the middle, 18 cm in length, gradually tapering to the acuminate apex, base also tapering into the broadly obtuse to rounded basal portion; midrib stout beneath, prominent clear into the apex, yellowish beneath from the base up, plane on the upper side or a trifle caniculate toward the base; nerves 7 on each side of the midrib or fewer and with secondary nerves in between, also prominent from beneath and of the same color, much ascending, their tips upwardly curved and coarsely anastomosing, the basal pair or two much

smaller and shorter, cross bars and reticulations conspicuous beneath, evident from the upper side; petioles blackish brown, relatively thick, 5 mm long, grooved along the upper side, strongly verrucose, glabrous, with a pair of short apiculate axillary bracts. Infructescence terminal or subterminal, few branched, the branches smooth and yellowish brown; pedicels ascending, alternating toward the distal ends of the branches, 1.5 cm long, rather thick and enlarged at their distal ends; fruits globose, up to 2 cm in diameter, smooth and russet brown when dry, with a thin fragile pericarp.

Type specimen number 16902, discovered by *A. D. E. Elmer* among shrubberies of light woods at about 1250 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Apparently it is not *Xanthophyllum affine Korth.* nor the two Philippine varieties of *Chodat.*

ROSACEAE

Rubus sorsogonensis Elm. n. sp.

A scandent shrub. Stems terete and covered with brownish bark and beset with dull spines; main branches long, rebranched, prickly; the twigs green, drying dark brown, the younger portion hirsute, the short but sharp spines retrorse, terete. Leaves scattered along the ultimate branchlets, alternate, subchartaceous, shallowly folded upon the upper side, chiefly horizontally spreading, curing similarly dark brown on both surfaces, glabrous except the midrib, nerves and cross bars, ovate, gradually terminating into a blunt or sharply pointed apex, base broadly rounded and cordate, margins serrate from the base clear into the apex, the larger blades 6 cm wide across the base by 10 cm in length but often considerably smaller; midrib conspicuous beneath and with recurved spinules,

ciliate especially along the lower side; nerves 4 or 5, the basal pair with secondary branches on its lower side, rather oblique, nearly straight, tips reticulately united, brown in color, sparsely ciliate on both sides of the blade, cross bars faint, reticulations obscure; petioles up to 2 cm long, yellowish brown pubescent, minutely prickly beneath, divaricate or ascending, usually upwardly curved at the base, subtended by a pair of stipular bracts which are lance shaped, 1 cm long and grayish appressed hairy on the exterior. Inflorescence arising from the uppermost leaf axils or upon short special flower bearing branchlets, 12 cm long on my specimen, paniculately branched from the base, the rachis and divaricate branches gray pubescent and minutely spinulose; flowers scattered all along but especially at the ends, their pedicels from 5 to 10 mm long, densely gray pubescent and subtended by linearly lanceolate and similarly pubescent bracts; buds conically pointed, the 5 petals finally spreading, sharply acuminate, united at the base, 1 cm long, densely velvety cinereous on both sides except the inner basal portion; stamens dull reddish brown when dry, numerous, erect, bearing small yellowish anthers.

Type specimen number 14607, discovered by *A. D. E. Elmer* and climbing upon trees and sprawling over their tops in wet earth of deep woods at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

Like *Rubus edanoi Merr.*, but sufficiently distinct, especially when compared side by side with the type. It is more distantly related to *Rubus benguetensis Elm.*

RUBIACEAE

Hedyotis pinatubensis Elm. n. sp.

Scattered erect or stunted shrubs. Stem rather rigid, smooth and gray; twigs greenish, numerous, ascendingly

curved, spreading and forming a dense mass, more or less angular, relatively short, glabrous, at intervals roughened by the leaf scars. Leaves crowded toward the ends of the twigs, suberect or ascending, entirely glabrous, opposite, subcoriaceous, somewhat paler green beneath even so in the yellowish dry state, ovately oblong to lanceolate, slenderly acuminate at the recurved apex, base broadly obtuse to rounded, 5 to 8 cm long, 1.5 to 2.5 cm wide below the middle, the entire margins minutely involute; midrib rather stout and blackish brown especially toward the base, with 4 to 6 much ascendingly curved nerves on each half of the blade; petiole murinus when dry, thick, 5 to 8 mm long more or less; the interaxillary bracts likewise glabrous, broad at the connate base, terminating with a few sublaciniate or pectinate appendages. Corymbose inflorescence erect or ascending, shorter than the foliage or equalling it, glabrous throughout, the main branches or peduncles arising from the uppermost leaf axils and very slender; secondary branches from above the middle, subtended by foliaceous bracts or bracteoles. Flowers usually 3 and terminal, the middle one upon shorter stalks or pedicels than the lateral flowers; the thin pedicels from a few to 10 mm in length, also subtended by small very narrow bracteoles; calyx 3 to 4 mm long, the ellipsoid ovary portion somewhat constricted at the top; the 4-segmented portion united at the base, the lobes triangularly ovate in outline, occasionally quite unequal in size, their tips blunt, veiny; corolla 12 mm long, white, the basal one half widely tubular, the upper half divided into 4 oblongish reflexed lobes or segments which are densely villous on the upper surface except at the very tips, otherwise glabrous even on the inside tube; stamens also 4, alternate, inserted below the throat, glabrous, the filaments short, anthers oblong and equalling the throat or exceeding it; style erect, strict, 12 mm in length, slender, glabrous except the cleft stigma which is short ciliate.

Type specimen number 22194, discovered by *A. D. E. Elmer* as scattered stunted shrubs in the chaparral vegetation of the mountain peak at 6000 feet altitude, Camp Stotsenburg (Mt. Pinatubo), Province of Pampanga, Luzon, May 1927.

Quite similar to *Hedyotis elmeri Merr.* which appears to be identical with *Hedyotis banksii Elm.*, but our specimens do not seem to match the types of either of the above named species.

Mussaenda milleri Elm. n. sp.

A laxly branched undershrub. Main stem 5 to 8 cm thick, 3 or more meters high, branched from below the middle; branches not very numerous, rebranched toward their ends, widely spreading, lax, easily breaking, subterete, grayish to brown; twigs green at their tips, the older portion yellowish gray to brown, minutely lenticelled, densely yellowish brown hirsute. Leaves opposite, horizontal, scattered along the branchlets or more or less clustered toward their ends, membranous, entire, flat or the sharply acute to acuminate apex recurved, below cuneate or rounded and terminated into an abruptly cuneate base, elliptic or ovately so, sometimes oblongish, varying from 7 to 12 cm in length, 3 to 6 cm wide across the middle or below it, sometimes much smaller ones interposed, here and there appearing anisophyllous, much lighter green beneath in the fresh and dry states, soft pubescent on both sides but especially beneath; midrib straight, prominent and densely hairy beneath, sunken along the upper side and filled with reddish brown hairs; nerves 5 to 8 on each side of the midrib, ascendingly curve from the base but especially toward their distal ends, less conspicuous on the upper surface, densely pubescent beneath; cross bars numerous, quite evident from the lower surface; petioles 1 to 2 cm long, bristly reddish brown hirsute, usually with a pair

of interaxillary and lanceolate stipules 1 cm long and covered with reddish brown bristly hairs. Inflorescence terminal, corymbosely paniculate, 15 cm long and nearly as wide across the top, yellowish brown hirsute, the divaricate branches flower bearing mostly at their distal ends, the basal pair of branches often subtended by foliaceous bracts, the upper branchlets subtended by linear bracts and covered with a similar pubescence; flowers few to severally clustered, bract subtended; pedicels short, calyx with 3 to 5 mm long setaceously pointed segments; corolla 2 to 3 cm long, slenderly tubular, hairy on the outside, the orange red elliptic lobes glabrous on the upper side; the occasional yellowish white bract subelliptic and upon a slender stipe.

Type specimen number 22694, discovered by *A. D. E. Elmer* upon the summit mountain ridge at about 3500 feet altitude, Camp Labi, Province of Nueva Ecija, Luzon, March 1937.

Sufficiently distinct from *Mussaenda anisophylla Vid.* in a number of distinguishing characters. Named after *Mr.* and *Mrs. Verne E. Miller* whose guests we were at their cottage at Camp Labi.

RUTACEAE

Clausena palawanensis Elm. n. sp.

A small tree. Stem crooked, branched from below the middle, the branchlets also crooked and rebranched toward their ends; twigs dark brown, terete, glabrous, smooth. Leaves alternate, more or less crowded from the distal ends of the twigs, erect or ascending, varying from 1 to 2 dm in length, bearing leaflets from below the middle; petiole about one fourth this length, dull reddish brown, slender, glabrous, terete, straight, gradually thickened toward the base where it is usually sprinkled with

rosin colored glands, leaving large circular whitish colored scars after falling; rachis similar exept a trifle more slender; leaflets in 3 to 5 subopposite pairs, ascending, flat or shallowly conduplicate, numerous, glabrous, entire, membranous, oblique, subovate to ovately lanceolate, diverse in size, gradually tapering from below the middle to the acuminate apex which in the fresh state is somewhat recurved, the rounded base very oblique, 5 cm long by 2 cm wide, the ovate basal leaflets much smaller, prominently punctate especially on the upper surface, subolivaceus on both sides when dry, the younger ones curing dark brown; the midrib very deep brown beneath, usually curved toward the base; nerves 3 to 5, ascending, faint, reticulations obscure, their tips interarching, similar in color; petioles 3 to 5 mm long, dark brown and gland dotted. Inflorescence suberect, terminal or from the uppermost leaf axils, shorter than the foliage, paniculately branched from above the middle, the divaricate branches rather short and very slender, all parts reddish brown and glabrous; flowers grouped from the ends of the ultimate branches, upon very unequally long pedicels; calyx short, bluntly 5-toothed; corolla much longer, tips incurved but finally spreading; stamens about as long.

Type specimen number 13147, discovered by *A. D. E. Elmer* in light woods of low country, Puerto Princesa (Mt. Pulgar), Island of Palawan, May 1911.

Similar to *Clausena todayensis Elm.* from mount Apo, but our inflorescence is entirely glabrous and relatively very slender in all its branching.

Lunasia truncata Elm. n. sp.

A suberect shrub, with a 3 cm thick stem and 2 to 3 m high; branches few and short rebranched toward the top; wood soft, dingy brown with a large pith, covered with a nearly smooth gray bark; twigs terete, the young

portion covered with an appressed short pubescence, ultimately glabrate, yellowish brown and dotted with lighter colored lenticels. Leaves alternate, exceedingly variable in size, ascending or horizontal, primarily flat, scattered, our largest blade 3.5 dm long, 12 cm wide above the middle, our smaller ones 4 by 10 cm, obovately oblong, the apex broadly rounded or very bluntly acute, entire, gradually narrowed toward the abruptly rounded base which sometimes appears slightly auriculate, lighter brown beneath when dry, subchartaceous; midrib stout and straight, ridged beneath, flat above, dark brown beneath and covered on both sides with a minute stellate whitish colored indumentum; nerves 10 to 22 on each side of the midrib, divaricate, parallel, similar in color, sprinkled with whitish colored minute scales; cross bars faint, reticulations none; petioles from 2 to 10 cm long or longer, narrowly grooved along the upper side, strict, slightly thickened at both ends, densely covered with yellowish to whitish colored minute scales. Infructescence suberect from the leaf axils, ours 7 to 12 cm long; the main stalk straight and stout especially toward the base, scale covered, short rebranched from near the base, the branchlets 1 cm long, relatively thick and wrinkled, covered with an indumentum; capsules usually 3-clustered, sessile, compressed, 1.25 cm long, subtended by the bract vestiges, their apices spreading, truncate at the apex, the sides toward the apex faintly corrugated transversely, densely covered with a cinnamon brown indumentum.

Type specimen number 15140, discovered by *A. D. E. Elmer* in well drained rocky ground among thickets and light woods at 750 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

It is not *Lunasia philippinensis Planch.* nor *Lunasia amara Blco.* and its variety. It is closer related to *Lunasia reticulata Elm.*

SABIACEAE

Meliosma apoensis Elm. n. sp.

Tree of a large size. Trunk 15 m high, 5 dm thick, somewhat crooked, branches from above the middle; branches numerous; twigs relatively thin, terete, more or less brown tomentose at their tips but otherwise glabrous, 7.5 mm thick on my specimen. Leaves 2 dm long or shorter, ascending, the rachis puberulent or the petiole glabrate and slender, the blackish brown petiole thickened at the base and leaving large scars; leaflets deciduous, alternately scattered, subchartaceous, glabrous except the puberulent midrib and nerves, sublucid on the upper darker green surface, drying much lighter brown beneath, the upper blades oblong to lanceolate, about 10 cm long by 3.5 cm wide across the middle, gradually reduced to the base where they measure 2.5 cm long by 1.5 cm in width and are ovate in shape, the normal leaflets are frequently slightly inequilaterally sided toward the petiolule, also tapering toward the obtuse to obtusely rounded and sometimes acute base, tapering to the acute to a sharply acuminate point, the basal margins entire, otherwise beset with spinulose teeth; midrib prominent beneath, caniculate above, brown when dry, puberulent; nerves 7 to 9 on each side, less prominent beneath, impressed above, ascending, their tips coarsely reticulate, similarly brown and puberulent on the lower surface; petiolules 5 to 15 mm long, deeply channelled along the upper side. Inflorescence nearly equalling the foliage, terminal or from the uppermost leaf axils, ascending, paniculately branched from or above the middle, densely dark or yellowish brown furfurescent; branches divaricate, short rebranched; flowers minute, scattered along the ultimate branches, early falling, cremeus, sessile or short pedicellate; calyx spreading, the 5 lobes obtuse and per-

sistent, subglabrous; corolla twice as long or longer, glabrous.

Type specimen number 11960, discovered by *A. D. E. Elmer* in the dense mount Apo forests along Mainit creek at 4250 feet altitude, Todaya (Mt. Apo), District of Davao, Mindanao, October 1909.

Meliosma sumatrana (*Jack*) *Walp.*, but our leaflets are much smaller, more sharply pointed and with narrower bases. Its panicle is also more branching and bearing smaller more scattering flowers.

Meliosma cannarioides Elm. n. sp.

Small erect tree. Stem 1.5 dm thick, 8 m high, mainly branched at the top; wood moderately soft, reddish brown toward the center, covered by a smooth or coarsely lenticelled grayish green bark; branchlets 1 cm thick, terete but roughened by circular or elliptic scars, the bud bracts ferruginous. Leaves alternately crowded from the distal ends of the twigs, ascending, 3 dm long or shorter, imparipinnate, straight, bearing numerous persistent leaflets from near the base; petioles 2 to 5 cm long, strictly erect or ascending, glabrous, subterete, very dark brown when dry, thickened at the base into an elliptic disk, the rachis lighter brown and slender; leaflets diverse in sized and shape, the terminal blades 15 cm long by 4 cm wide, lanceolate, slenderly tapering into the long acuminate recurved point, mostly obtuse at the base or the lower ones rounded, nearly all slightly inequilateral toward or at the base, gradually reduced in size and shape toward the base where the ovate leaflets measure 2 by 3 cm, all intergrading forms in between these extremes, usually 5 to 7 opposite or subopposite pairs of leaflets to a leaf, the basal and apical portion entire, the intervening margins usually beset with a few widely scattering

spinules; midrib conspicuous beneath, dark brown, puberulent, narrowly grooved above; nerves 5 to 7, ascendingly curved, their tips coarsely anastomosing, reticulations faint yet evident from the lower surface; petiolules on an average 5 mm, that for the terminal leaflet three times as long, sharply ascending from the base, very dark brown or nearly black and glabrate, caniculate along the upper side. Panicle 15 cm long, nearly as wide across the base, erect or nearly so, apparently subterminal, its branches widely spreading from the middle, brownish but nearly black when dry, puberulent but glabrate in our fruiting state. Fruits ellipsoid or globose, 4 mm long, smooth, subsessile and subtended by bract vestiges, black when dry but shining green when fresh.

Type specimen numbers 17086 and 16297, discovered by *A. D. E. Elmer* upon humid forested slopes at 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Between *Meliosma megalobotrys Merr.* and *Meliosma brachybotrys* of the same author, our specimens are more closely allied to the latter species. Our leaves have more numerous, more divergent and narrower leaflets. The infructescent stalks including the pedicels are slender, not thick and angular as in his type specimen.

Meliosma macrocarpa Elm. n. sp.

A very slender tree. Trunk 3 dm thick, 12 m high, terete and strongly buttressed at the base; wood moderately hard and tough, light, the outer half white and gradually changing to the reddish colored heartwood, odorless and tasteless; bark blotched, smooth or peeling in small plates, the inner portion testaceus; branches chiefly at the top, crookedly rebranched and spreading; twigs few, 2.5 cm thick, the apical leaf bearing portion fulvus pubescent.

Leaves a meter in length or shorter, rotately spreading, not numerous, alternate, our leaf measures 5 dm long, leaflet bearing from below the middle; petiole stout, much ascending, 12 cm long or longer, glabrous, gradually tapering to the swollen and fulvus colored base, the upper side flat or broadly grooved toward the axil of the petiole, leaving large scars; leaflets subchartaceous, alternate or subopposite along the smooth and terete rachis, 2 dm long or the basal ones shorter, 7 cm wide, entire, glabrous, strongly recurved toward the abruptly acuminate apex, base broadly rounded and very unequally sided, oblong in shape, frequently a trifle curved or twisted, conduplicate, of a rich deep brown beneath when dry, duller above; midrib raised and blackish brown beneath, plane above, glabrate, usually curved toward the base; nerves yellowish white when fresh, drying brown, ascendingly curved, 9 to 12 on each side according to the size of the leaflets; reticulations fine, quite evident beneath, the lower surface minutely punctate in between; petiolules very short or none, ascendingly curved, rather thick and black when dry. Infructescence arising terminally above the foliage and exceeded by the leaves, flexible, subpendant, very sparingly branched, the main stalks cremeus toward the base when collected, otherwise green, yellowish brown puberulent; the base of the peduncle thickened and leaving elliptic scars upon falling, 2 to 3 dm long on my specimen; fruits upon 5 to 15 mm long more or less thickened pedicels, green, compressed globose, more narrowed toward the base, 2 cm long, curing blackish brown, smooth but exceedingly wrinkled, few, 5-seeded or at least 5-ovuled.

Type specimen number 12855, discovered by *A. D. E. Elmer* in gravelly wooded flats along the Balsahan river at 250 feet altitude, Puerto Princesa (Mt. Pulgar), Island of Palawan, March 1911.

Leaves very similar to *Meliosma macrophylla Merr.* but our fruits are entirely too large.

SAPOTACEAE

Palaquium aureum Elm. n. sp.

A medium sized tree. Trunk 3 dm or more in diameter, 10 m high, branched from the middle; wood moderately hard, white on the outside; bark gray, smooth or lenticelled and with excrescences, testaceus except the epidermis, with sticky latex; main branches spreading, freely rebranched, the ultimate ones comparatively short and divaricate; twigs with ascending tips, crooked, terete, gnarly and roughened by the leaf scars, brown to gray when dry, glabrate, wrinkled, the young annular twigs arising from below the second year twigs, ascending, smooth, glabrate, greenish but curing brown, tips also upwardly curved. Leaves alternately crowded from the distal ends of twigs, oblanceolately oblong, entire, primarily horizontal or the uppermost ones ascending, coriaceous, flat or nearly so, normally with a bluntly acute apex, gradually tapering from above the middle toward the narrowed base but bluntly terminated, 20 cm long and 6 cm wide above the middle, sometimes smaller, glabrous on the upper side which in the fresh state is shining and bright green, turning blackish brown when dry, the lower surface covered with a soft velvety sulphur yellow indumentum which turns dull brown in age; midrib raised beneath, similar in color and indumentum beneath, flat and grooved on the upper surface; nerves 9 to 12, ascending, their tips very faint, covered with the same indumentum on the lower side, cross bars not evident; petioles 1 cm long, glabrate, stout, flat and shallowly grooved along the upper side, leaving large scars after falling. Infructescence lateral along the twigs, alternately clustered;

pedicels 3 cm long or less, strict, mainly ascending, yellowish brown pulverulent; the subtending calyx segments spreading, persistent, the outer ones thick and rugose, obtusely rounded; fruits green when collected, smooth or pulverulent, ellipsoid, 1.5 cm long, terminated by a slender persistent style.

Type specimen number 15775, discovered by *A. .D E. Elmer* in rich or black ground of a wooded depression at 2500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, April 1916.

Among half a dozen species of *Palaquium* in the Philippines with golden yellow or rusty brown lower leaf surfaces, ours seem to come nearest to *Palaquium ahernianum Merr.*

Palaquium sorsogonense Elm. n. sp.

A middle sized tree or smaller. Trunk 3 dm in diameter, terete, 8 m high, crooked and branched toward the top; main branches with few branchlets; bark gray to brown mottled; twigs also terete, yellowish gray, the young tips ferruginous pubescent, 5 mm thick in the dry state. Leaves not many, subchartaceous or submembranous, widely spreading, nearly flat or shallowly folded toward the base, glabrous above except the midrib, beneath very sparsely sprinkled with hairs, sublucid and darker green on the upper side which turns nearly black when dry, entire, the lower side drying dull copper brown, obovately oblong, rounded toward the very short acute apex, gradually tapering from above the middle toward the abruptly terminated base, in general outline the base appears cuneate, 3 dm long by 13 cm wide above the middle, our smallest blade 12 by 22 cm; midrib very prominent beneath, straight, ferruginous pubescent, the sunken upper side filled with a similarly colored pubescence; nerves 14 or

15 from each side of the midrib, ciliate along the lower side, parallel, subdivaricate, relatively conspicuous, much ascendingly curved toward their distal ends; cross bars numerous, scarcely visible on the lower surface; petioles 1 cm long, comparatively thick and subcompressed, grooved along the upper flattened side, densely ferruginous, leaving large scars after falling. Bud inflorescence lateral from the twigs, in small subsessile clusters and densely covered with a reddish brown tomentum. Fruits lateral, divaricately scattered, upon pedicels 2 to 3.5 cm in length, very bluntly pointed at the apex, base rounded and subtended by the persistent calyx segments, ellipsoid, longitudinally rugose when dry, dull brown puberulent or pulverulent.

Type specimen number 16714, discovered by *A. D. E. Elmer* in secondary forests at 1500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, July 1916.

Our leaves are entirely too large for *Palaquium barnesii Merr.*, and our fruits are different in shape.

SAXIFRAGACEAE

Polyosma sorsogonensis Elm. n. sp.

A small suberect tree. Stem subterete, 2 dm thick, 7 m high or higher, branched from the middle; wood dingy white, very soft; bark brown, more or less checked; branches numerously rebranched, the ascendingly curved twigs green but turning black in drying, terete, smooth or roughened by the leaf scars, entirely glabrous even the young tips. Leaves usually opposite but occasionally single or 3-whorled, crowded toward the ends of the branchlets, ascending, flat or the acute to subacute tips recurved, subcoriaceous, entire, narrowly cuneate toward the base, broadly and obovately lanceolate to oblong, the

smaller blades lance shaped with the widest portion across the middle, our largest leaves 3.5 cm wide above the middle by 12 cm in length, much paler on the lower side both in the green and dry states, drying black above and dark brown beneath, glabrous, the smallest ones on my specimen 1.5 cm wide by 5 cm long but with intermediate sizes; midrib keeled beneath, smooth and glabrous, strict, plane above or caniculate toward the base; nerves 5 to 8 on each side, ascending, slightly curved, their fine tips usually interarching and reticulately united, not visible from the upper surface, reticulations faint and coarse; petioles 1 to 2 cm long, erect or much ascending, slender, minutely strigose when young but soon becoming glabrate or glabrous, minutely caniculate along the upper side, leaving relatively large grayish white scars after falling. Spikes terminal or from the uppermost leaf axils, 15 cm long more or less, ascendingly curved; peduncle slender, glabrous, 4 to 8 cm long; rachis also slender, puberulent, densely flower bearing; flowers divaricately clustered, 1 to 1.5 cm long, solitary or few clustered, their very short pedicels and calyces short cinereous; the cremeus corolla tube faintly or scarcely pubescent on the exterior; the recurved segments finely pubescent on the ventral sides. Fruits upon pedicels 5 mm long, fusiform, apiculate at the apex, somewhat thickened at the base, 1.25 cm long when mature, glabrous, blackish when dry.

Type specimen numbers 16678, 15263 and 14693, discovered by *A. D. E. Elmer* in damp wooded depressions at about 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October to November 1915 and July 1916.

The difference of our fruits primarily distinguish it from *Polyosma apoensis Elm.* From *Polyosma lagunensis Merr.* our specimens differ in their glabrous leaves, slender peduncles and in other minor characters. In

Merrill's type the spikes are floriferous from the base up to the apex.

SYMPLOCACEAE

Symplocos bulusanensis Elm. n. sp.

A suberect small tree. Stem crooked and subterete, branched from above the middle or mainly toward the top; the larger branches widely spreading, numerously rebranched toward their ends, smooth and gray in color; twigs greenish, terete or angular at their tips, glabrous, dull brown when dry, slender, ascending, the ultimate ones comparatively short. Leaves numerous, persistent, glabrous, submembranous, flat or with recurved tips, curing almost similarly brown on both sides yet slightly lighter beneath in the dry as well as in the fresh states, variable in size from ovately elliptic to broadly lanceolate, the entire base rounded to broadly obtuse, 4 to 6 cm long and 2 to 3 cm wide across the middle or a trifle below this, the apical portion acuminate or acuminately pointed, the tips frequently curved to one side, the medium portion of the margins subentire or obscurely denticulate, alternately well scattered, sometimes opposite; midrib smooth and darker brown beneath, narrowly caniculate along the upper surface; nerves 4 to 5 or even 6 from each side of the midrib, relatively very faint, reticulations scarcely visible from the lower side; petioles slender, blackish on my specimen, glabrous, subterete and minutely grooved on the upper side, averaging 1 cm in length, ascending. Panicle terminal or from the uppermost leaf axils, single or occasionally two arising from the same point, very slender, smooth and glabrous, brownish black when dry, up to 6 cm long, erect or ascending, occasionally branched from near the base and upwards, the terminal branchlets reduced to mere pedicels; flowers deciduous, upon short slender pedicels

or subsessile; calyx short turbinate, apparently fulvus pubescent, truncate; petals 5, obovately oblong, very strongly recurved, 4 mm long by one half as wide, brown and glabrous on both sides; stamens very numerous, persistent upon the base of the corolla, the reddish brown filaments bearing small yellow anthers.

Type specimen number 17132, discovered by *A. D. E. Elmer* in woods and shrubberies at 1250 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

Our flowers are different from *Symplocos salix Brand.* It is nearer to *Symplocos acuminatissima Merr.*, but our leaves are broader with shorter tips and rounded bases. Inflorescence few paniculately branched, not racemose as in *Merrill's* flowerless type.

Symplocos verdifolia Elm. n. sp.

A little tree or shrub like. Stem crooked, branched from below the middle, 15 cm thick, 5 m high; branchlets also more or less crooked, the ultimate ones straight and slender; twigs thin, terete or compressed and longitudinally fluted toward their distal ends, brown on my specimen, spreading or ascending, smooth and glabrous. Leaves subpersistent, glabrous, mostly alternate, ascending, membranous, broadly lanceolate to narrowly oblong, 3 cm wide at the middle its widest portion, 10 cm long, frequently smaller in size, brownish and lucid on the upper side when dry, beneath green even when dry, the entire base obtuse to cuneate, gradually tapering into a slenderly acuminate apex which is often somewhat curved to one side, margins serrately toothed; midrib conspicuous beneath and yellowish brown, narrowly caniculate on the upper leaf surface; nerves about 6 on each half of the blades, ascendingly curved from the base, also yellowish brown beneath,

evident from the upper side, reticulations obscure yet more evident from the upper leaf surface; petioles 1 to 1.5 long, brown when dry, ascending, narrowly caniculate along the upper side, slightly enlarged toward the base, usually with a circular chalky white disk in their axils. Racemose inflorescence erect from the leaf axils, up to 4 cm long, usually single, the rachis very slender and puberulent but soon wearing glabrous, dark reddish brown; pedicels 3 mm long or shorter, finely brown pubescent; calyx soft ferruginous, short turbinate or cup shaped with broadly rounded segments; corolla 2 to 3 times as long, the dorsal side of the broadly elliptic petals puberulent. Fruits upon very slender 5 mm long pedicels, 1 cm long, ovoid or ovoidly globose, narrowed to the bluntly rounded apex, smooth, greenish even when dry.

Type specimen number 15356, discovered by *A. D. E. Elmer* in subalpine light woods along a creek at 2000 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

It does not seem to match none of our Philippine species of *Symplocos*, but apparently it is allied in the group of *Symplocos villarii Vid.* and *Symplocos polyandra (Blco.) Brand.*

TACCACEAE

Tacca weberi Elm. n. sp.

A terrestrial bi or perennial herb. Corms 2 or 3-clustered, subherbaceous, 2 to 3 cm thick, yellowish brown, subovoid to ovoidly elliptic but quite irregular in shape, the flattened base and sides provided with yellowish white flexible roots. Leaf stems 2 or 3-clustered from the apical portion of the older corm, erect, crooked or twisted near their bases, otherwise straight, very slender.

glabrous, light brown when dry, subterete and fluted from base to apex, practically of the same thickness throughout, herbaceous, 2.5 dm long, terminated by a single leaf; blade very membranous, mostly ascending, thin or subflaccid, glabrous, much paler green beneath even so in the dry state, quite variable in size, the largest one on our specimen 18 cm long by 24 cm wide across the base, flat or plicately folded toward the base, easily breaking when dry, divided into 3 to 5 main sections down to within 2 to 3 cm from the base of the leaf, most of these sections are again divided half way up the length of the leaf divisions, entire; ultimate segments 5 to 10 cm long, the lateral ones shorter, the middle ones longest, linear, ascending, from 1 to 2 cm wide, gradually tapering to the slender apex; midrib of the main sections arising from the base or near it, conspicuous and light brown beneath, straight, the central one divided and ascendingly extended into the lateral segments. Inflorescent stem arising from the corm, brown, glabrous, fluted, also very slender, erect, about as long as the leafy stems or exceeding them, terminated by a cluster of flowers or fruits; involucral bracts usually in pairs, apparently sessile but narrowed toward the base, unequal, up to 5 cm in length, broadly ovate, abruptly terminated into a sharply acuminate apex, thin, spreading, green and foliaceous; flowers severally clustered upon slender 1 to 1.5 cm long pedicels, erect but spreading; seeds few in the fleshy fruits, very dark brown and very irregular in shape, 2 to 5 mm across, coarsely rugose or ruminate.

Type specimen number 17210, discovered by *A. D. E. Elmer* in open fields of damp ground, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, September 1916.

To be compared with *Tacca elmeri Krause*, but apparently distinct. *Weber's* collection number 1522 from

Malitbog, Leyte is no doubt the same species as here published. Named after the late *C. M. Weber*.

ULMACEAE

Celtis multifolia Elm. n. sp.

Tree of medium size or smaller. Main branches spreading, finally numerously rebranched and forming dense masses; branchlets terete, glabrous, smooth, brown on my specimen, comparatively short, the leaf bearing twigs mostly in pairs and rather thin; the final portion of the twigs straight, erect, light brown, very gradually thickened and ridged toward the distal end where it is terminated by a bud and a single leaf. Leaves coriaceous, conduplicate, terminal, solitary and subtending the 7.5 mm long and very sharply pointed grayish pubescent apex, our largest blades 8 cm long by nearly half as wide across the middle, sometimes smaller, entire, glabrous on both sides, oblongish in general shape or ovately oblong, base obtuse, gradually tapering into the sharply acuminate recurved apex, curing dark brown on both sides; midrib straight, pronounced beneath, plane above, brown and smooth; nerves of a single pair, arising from the base and curvingly extending clear into the apex, with few faint ascendingly curved nerves on their outer sides toward the leaf margins, reticulations evident from both sides; petioles 5 to 8 mm long, much ascending, usually a trifle pubescent at the leaf base, nearly black when dry. Infructescence arising from the uppermost leaf scars, divaricate, glabrous, 2 to 4 cm long, spicate or very short branched at the distal end and fruit bearing; drupes ovoidly ellipsoid, 1 cm thick and 1.5 cm long in the dry state, rounded at the base, pointed at the apex, smooth and glabrous.

Type specimen number 17805, discovered by *A. D. E. Elmer* in woods at low or medium altitude, Los Banos (Mt. Maquiling), Province of Laguna, Luzon, July 1917.

Our species here described cannot be classed with *Celtis philippensis Blco.* or with *Celtis luzonica Warb.* The shape of our more numerous leaves are similar to *Celtis mindanaensis Elm.*, but they are only one half as large and without nerves. My number 16028 from Irosin was distributed under this new species name, but it is not typical.

VERBENACEAE

Callicarpa subcandida Elm. n. sp.

A lax undershrub. Stem single or few from the same root, ascending, branched from below the middle, 2.5 cm thick, 3 m high, terete; wood dingy white, soft, with a large white pith; bark brown, lenticelled, the hypodermis green; main branches ascending, laxly rebranched, the terete 5 mm thick twigs covered with a grayish white indumentum. Leaves comparatively few, widely scattered and opposite, horizontal or descending, whitish and minutely papillate on the lower surface, the upper green side turning brown upon drying and entirely glabrous, submembranous or subchartaceous, broadly lance shaped in outline or oblongish, 15 to 25 cm long, 6 to 9 cm wide across the middle, the basal subcuneate portion with entire edges, otherwise unequally short dentate, gradually tapering into the acute to acuminate apex; midrib covered with a grayish white indumentum and prominent beneath, slightly caniculate on the upper side toward the base; nerves 7 to 10 on each side of the midrib ascendingly curved, less prominent; reticulations numerous, not visible from the upper surface, the interstices minutely stellate punctate on the lower surface only; petioles stout, suberect, 2 to 4 cm long, yellowish to gray, very short tomentose, longitudinally ridged or caniculate along the upper side. Inflorescence from the leaf axils or from the axils of fallen leaves, scurfy brown pubescent when young, densely

corymbosely paniculate from near the base, numerously rebranched and forming a dense mass 5 cm across, the numerous short and divaricate branchlets including the short pedicels and even the calyx cup turning gray when old; corolla creamy white. Fruits or berries globose, glabrate, 1.5 to 2 mm in diameter, azure blue.

Type specimen number 15124, discovered by *A. D. E. Elmer* in moist stony ground among thickets of a steep incline at 750 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

Evidently our specimen is best matched by *Callicarpa nana Linn.* or *Callicarpa bicolor Schauer*, but our leaves are larger, longer petioled, more attenuate toward the base and with a different indumentum on the flowers.

Vitex bulusanensis Elm. n. sp.

A small suberect tree. Trunk 3 dm in diameter 8 m high, subterete, branched chiefly toward the top; wood very hard and brittle, dull brown except the thin dingy or yellowish white sapwood; bark smoothish, gray, melleus except the epidermis; branchlets ascending, rigid and breaking with a snap, gray and glabrous, the young twig portion covered with a ferruginous pubescence which soon wears off with age. Leaves not numerous, opposite, terminal or laterally scattered; petiole on our leaf 8 cm long, stout, terete, ferruginous, swollen at the base and leaving large obconic scars after falling, blackish brown when dry, thickened at the distal end; leaflets 6 on our specimen, diverse in size, the upper or largest blade 12 cm wide across the middle or widest portion, 26 cm long, the lower or smaller blades 5 by 10 cm in size or even smaller, elliptically oblong, horizontally spreading, subchartaceous, entire, shallowly folded upon the upper sublucid surface, base obtuse, apex mostly acute and recurved, only slightly

paler green beneath, curing nearly equally tan brown on both sides, glabrous; midrib pronounced beneath and dark brown, plane on the upper side or caniculate toward the base; nerves 5 to 15 according to size, conspicuous, ascending, subparallel, tips reticulately united or anastomosing, primary reticulations coarse, ultimate reticulations very fine; petiolules 1.5 to 4 cm long, radially spreading, strict, yellowish brown pubescent especially at their thickened bases, relatively stout, channelled along the upper side. Infructescence suberect or erect, terminal or axillary, about as long as the foliage, sparingly paniculately branched, 1 to 3 dm long, branched from below the middle, also ferruginous when young, glabrous and curing blackish brown; fruits upon broadly turbinate sessile or subsessile cups which are yellowish brown pubescent on the outside, scattered along the slender branchlets and subtended by minute bracteoles, pale green when fresh except the shining subglaucous black fruits which are ellipsoid, 1.5 cm long and longitudinally striate.

Type specimen number 17004, discovered by *A. D. E. Elmer* in secondary woods at 1750 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Vitex curranii H. Lamb, but our larger leaflets are not so thickly coriaceous, they are more numerously nerved and with reticulations quite evident from the lower side.

VITACEAE

Columella irosinensis Elm. n. sp.

A scandent shrubby vine. Stem repeatedly branched, its long branches rambling, the ultimate twigs subherbaceous, greenish but turning grayish brown, glabrous and terete; tendrils very tough and wiry, leaf opposed from the twigs or from their axils, 1 to 2 dm long, curved and twisted, sometimes forked toward their ends, glabrous,

dirty brown, smooth, slender, the basal one third usually straight, persistent. Leaves 5-foliolate, alternate, very widely scattered, ascending or suberect, coriaceous; petioles thick and coriaceous, 5 to 8 cm long, green but turning yellowish brown while curing, upwardly curved from the persistent base, terete; petiolules also green and similarly colored when dry, puberulent when young, otherwise glabrate, the straight and erect middle one 5 to 6 cm long, the lateral pair divergent and a few cm shorter, otherwise similar; secondary petiolules 1 to 1.5 cm in length, thinner, similar in color and vestiture; blades coriaceous, glabrous on both sides except the midrib and nerves on the lower side toward the base, elliptic or ovately to obovately elliptic, 12 cm long, 8 cm wide or smaller, conduplicate or flat, occasionally inequilateral at the rounded to subcordately rounded base, the middle one equilateral, apex short acute to short acuminate, the broader leaflets of the lateral ones only seldom bilobed on their upper or lateral sides, margins obscurely dentate to crenate from base to apex, nearly equally brown on both surfaces when dry: midrib yellowish brown, more pronounced beneath, puberulent beneath toward the base; nerves 5 more or less, oblique, similar in color, glabrate or slightly puberulent on the lower side toward the base; cross bars quite evident. Inflorescence axillary or subterminal, 10 cm long, divaricately and paniculately branched from below the middle, glabrate, the ultimate branches thin; pedicels filiform, 3 to 5 mm long; calyx glabrous, cupular; petals twice as long. Drupes fleshy, obovately globose, 7.5 mm across in the dried more or less compressed state, usually few seeded.

Type specimen number 15526, discovered by *A. D. E. Elmer* in thickets along streams at low altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, November 1915.

Its affinity is with *Columella geniculata* (*Blm.*) *Merr.*, but from typical specimens of that species our broad leaflets are different in shape and are usually more than 3-foliolate.

Leea bulusanensis Elm. n. sp.

A suberect shrub like small tree. Stem nearly 15 cm thick, terete, 7 m high, crooked, mainly branched from the top but occasionally from below the middle; branches few, also crooked, spreading, glabrous, apparently smooth; bark dull gray, spineless, with a green hypodermis, covering the soft sappy white wood; the twigs turning nearly black when dry. Leaves a meter long, decompound, triangular in outline, the ultimate leaf sections imparipinnate, ascending, glabrous, in opposite pairs; main rachis 1 cm long or longer, the secondary rachis shorter, all subterete and drying murinus or blackish brown, more or less thickened at the point of insertion; leaflets subchartaceous, shallowly folded, paler green beneath, 5-foliolate, the terminal one 15 to 18 cm long and broadly lanceolate, about 6 cm wide below the middle, the basal ones 6 to 8 cm long by 4 cm wide and ovate to ovately elliptic, base broadly obtuse to truncately rounded, gradually tapering toward the apex, terminated into the 1.5 to 2.5 cm long setaceous point, margins serrately toothed except at or around the base, when dry dark brown beneath and murinus above; midrib keeled beneath, narrowly grooved above or upper side; nerves 4 to 8 according to size of leaflets, conspicuous, ascending and tips more or less interarching, cross bars faint; terminal petiolule 5 cm long, the lateral ones 1 to 1.5 cm long only, channelled along their upper sides, glabrous, black in the dry state. Infructescence terminal, subcorymbose, 3 dm in length, heavy, the peduncle green and somewhat compressed, blackish on my specimen, glabrous, usually 3-branched, the

secondary peduncles likewise compressed and similarly rebranched, greenish, puberulent, the ultimate branches short and curing blackish brown, all of them angularly compressed and puberulent; pedicels 3 to 4 mm long, red, usually terminated by the persistent calyx subtending the flattened and shining fruits which are pale or glaucous red on their exposed sides.

Type specimen number 17089, discovered by *A. D. E. Elmer* in damp forested depressions at 2500 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, August 1916.

Not *Leea manillensis Walp.* nor *Leea negrosensis Elm.* or *Leea luzonensis Elm.* My numbers 14972 and 16231 from this same locality are referable to this new species.

Tetrastigma silvestrei Elm. n. sp.

A woody tree climber. Stem very flexible, 3.5 cm thick, usually somewhat flattened, repeatedly branched; branchlets very tough, terete, green, the free portions hanging in masses, curing reddish brown; twigs similar in color, glabrous, terete, obscurely striate and wrinkled longitudinally, at right angles to the larger branchlets, also green and subcoriaceous when collected. Leaves heavy, alternate, widely scattered upon erect or ascending petioles, usually 7-foliolate but occasionally only 5-foliolate, seldom 3-foliolate; petiole stout, fleshy, 5 to 8 cm long, subterete, suberect from upwardly curved bases, glabrous, brown when dry; petiolules much thinner, greenish but reddish brown in the dry state and wrinkled, the middle one for the terminal leaflet 3 cm long, the basal or lateral pair about 2 cm long and divaricate, each division bearing 3 leaflets of which each is upon still shorter and ultimate petiolules, glabrous, all pale green and drying reddish brown; blades very unequal in size, more or less folded

upon the upper darker and sublucid green surface, thickly coriaceous, all curing reddish brown on both sides, broadly obtuse to broadly rounded at the entire base, edges obscurely or undulately toothed or serrate, rounded at the top and terminated into a short apiculate tooth or in a narrow point 1.5 cm in length, the basal portion frequently inequilateral, ovately elliptic, the largest leaflet 7 by 9 cm but mostly smaller in size; midrib wrinkled longitudinally, conspicuous beneath; nerves 4 to 6 on a side, ascending and upwardly curved, rather faint, reticulations none. Infructescence upon specialized lateral twigs, free or from the leaf axils, 10 cm long, branched at or from below the middle, the bendable peduncle stout, all the secondary branchlets stiff and comparatively stout, pale green, dark brown when dry; pedicels up to 1 cm long; drupes compressed globose, 1.25 cm in diameter, hard, pale white, fleshy, drying black.

Type specimen number 14663, discovered by *A. D. E. Elmer* climbing with other vines upon forest trees up to 30 feet high at 750 feet altitude, Irosin (Mt. Bulusan), Province of Sorsogon, Luzon, October 1915.

Number 3258 *Merrill* was determined by *Gagnepian* as *Tetrastigma harmandii Planch.*, but the seeds of our fruits are very different in shape. It is also related to *Tetrastigma lanceolarium (Wall.) Planch.* and *Tetrastigma strumarum Gagn.* Named after *Silvestre Dumo* an Ilocano helper.

ZINGIBERACEAE

Alpinia luteo-carpa Elm. n. sp.

Small tussocks. Stems erect or nearly so, a meter high but variable in length, unbranched, glabrous, smooth, very slender toward the base, leaf bearing above the middle. Leaves sessile, many, in alternate rows, glabrous on

both sides, entire but edges wrinkled in the dry state, darker green on the upper surface, curing slightly unequally brown on the two faces, our largest leaves toward the top of old and fruit bearing stems 17 cm long by 5 cm wide across the middle, most of them smaller and much narrower toward the distal end of the sterile stem, those scattering toward the base short but relatively broad or even bract like, the larger blades narrowly oblong, the upper blades reduced and linearly lanceolate, all gradually tapering into the slenderly or sharply acuminate apex, base obtuse or obtusely rounded; midrib stout toward the base, faint toward the apex, conspicuous beneath, smooth, glabrous, light brown; nerves very oblique, numerous, parallel, faint from both sides; petioles none; sheaths ensiformly overlapping, the upper exposed portion varying from 3 to 5 cm in length and gradually becoming separated, totally glabrous, the distal portion striate on both sides, with thin margins; ligule short truncate, usually unequal in size on the two sides at the leaf base. Infructescence subtended by foliaceous bracts, spicate, terminal; peduncle with rachis 1 cm long on my specimen, strongly recurved, fruit bearing from below the middle, the pedunculate portion terete, the rachis portion ridged and dull or deep brown when dry, roughened by the circular persistent pedicel scars, entirely glabrous; mature capsules dull yellow, glabrous, up to 3 cm long, 2 cm thick across the middle or widest portion, elliptic to ovately elliptic or subglobose, dehiscing into 3 slightly unequal carpels from apex toward the base, the dry ones dull brown on the exterior, light grayish brown on the interior; seeds numerous, irregularly compressed, nearly black, smooth, up to 5 mm long or thick, broadly elliptic to subglobose in general outline.

Type specimen number 17926, discovered by *A. D. E. Elmer* in humus covered but well drained soil of dense

woods along steep ravines at 2000 feet altitude, Los Banos (Mt. Maquiling), Province of Laguna, Luzon, July 1917.

Plagiostachys lata Elm. n. sp.

Dense clumps. Stems nearly 2 cm thick for the larger ones, swollen at the base, 2 m high or longer. Leaves not numerous, alternate, membranous, ascending but often recurved toward the distal ends, the middle or larger blades up to 9 dm long without the petiole by 13 cm wide, linearly oblong in general outline, gradually tapering into the setaceous apex, the subequal basal sides also gradually tapering, my smallest leaf lanceolate, 6.5 cm wide by nearly 3 dm long, light brown beneath, dark brown above in the dry state, margins entire and wavy, the sides more or less corrugated when fresh, the lower surface slightly appressed pubescent when young especially the apex, the upper side glabrous; midrib prominent beneath, caniculate above, minutely striate and glabrate, in color the same as the lower leaf surface; nerves very oblique, very fine, equally visible from both sides; petiole 2 to 5 cm long, folded upon the upper side, numerously fluted on the lower side; sheaths narrowly ridged longitudinally, its sides well covering the stem and inner sheaths; ligule oblongish, 2 cm long, membranous, caducous, more or less unequal on the two sides. Fruiting heads 5 to 8 cm across, upon equally long stalks which arise from the lower side of the stem bulb; peduncles pale bracteate, horizontally curved, tough or half woody, roughened by the old persistent scars; fruiting pedicels ascending, 1 cm long on our dry specimen, rigid; capsules ovoidly globose, prominently pointed when dry, 2 to 3 cm long, conspicuously ridged and winged longitudinally, the wings irregularly toothed, pale green but the exposed portions green as grass.

Type specimen numbers 18234 and 17618, discovered by *A. D. E. Elmer* in open places or among shrubberies of the foothills, Los Banos (Mt. Maquiling), Province of Laguna, Luzon, June to July 1917.

The following numbers of my collection with unpublished new names should be considered published specific names as indicated below with their authors.

17237 — Aporosa bulusanensis is Aporosa sphaeridophora Merr.
15563 — Aporosa rotundifolia is Aporosa sphaeridophora Merr.
15645 — Aporosa sorsogonensis is Aporosa sphaeridophora Merr.
14901 — Ardisia perpunctata is Ardisia pardalina Mez
15882 — Ardisia sorsogonensis is Ardisia squamulosa Presl
15785 — Artocarpus sorsogonensis is Artocarpus ovatifolia dolichostachya Merr.
17433 — Arundinella montalbanica is Arundinella miliacea Nees
15580 — Baccaurea bakeri is Baccaurea tetrandra (Baill.) Muell.
15589 do.
15821 do.
15262 — Begonia bulusanensis is Begonia binuangensis Merr.
16083 do.
14366 — Begonia hemicardia is Begonia binuangensis Merr.
16661 — Begonia lateralis is Begonia pseudo-lateralis Warb.
17398 — Boea pseudoglandulosa is Boea philippinensis Clarke
15561 — Capparis brownei is Capparis viridis Elm.
16743 — Capparis irosinensis is Capparis viridis Elm.
15956 — Capparis irosinensis is Capparis oblongata Merr.
15588 — Cissus ambigua is Cissus assamica (Laws.) Craib.
16786 — Codiaeum irosinense is Codiaeum luzonicum Merr.
15318 — Connarus sorsogonensis is Connarus fragrans Elm.
14888 — Connarus trifoliatus magnus is Connarus trifoliatus (Turcz.) Rolfe
15479 — Cratoxylon punctulatum is Cratoxylon blancoi Blm.
15324 — Crypteronia laxa is Crypteronia cumingii (Planch.) Endl.
8531 — Cryptocarya fuliginosa is Cryptocarya villarii Vid.
16673 — Cyrtandra bulusanensis is Cyrtandra williamsii Krzl.
15177 do.
16453 do.
16328 — Dichroa thyrsoidea is Dichroa platyphylla Merr.
15893 — Diospyros bulusanensis is Diospyros pilosanthera Blco.
16885 — Diospyros dubia is Diospyros pilosanthera Blco.

15282 — Discocalyx acuminatissima is Discocalyx congestiflora Elm.
16823 — Discocalyx sorsogonensis is Discocalyx linearifolia Elm.
15372 do.
16313 do.
16478 — Elaeagnus cuprea is Elaeagnus philippinensis Perr.
16188 — Endospermum philippinense is Endospermum peltatum Merr.
15305 — Entada lianoides is Entada phaseoloides (Linn.) Merr.
16723 do.
15013 — Eugenia bulusanensis is Eugenia livida Elm.
17318 do.
15233 — Eugenia eucaudata is Eugenia saligna (Miq.) C. B. Rob.
15433 do.
16341 — Eugenia irosinensis is Eugenia everettii Merr.
16265 — Eugenia pacifica is Eugenia perpallida Merr.
11312 — Eugenia sibulanensis is Eugenia arcuatinervia Merr.
16997 — Eugenia vulcanica is Eugenia livida Elm.
17392 — Flacourtia peninsula is Flacourtia lanceolata Merr.
17359 — Freeria strongei is Pyrenacantha repanda Merr.
14061 — Freycinetia agusanensis is Freycinetia acutifolia Merr.
13766 — Freycinetia urdanetensis is Freycinetia scabripes Warb.
17030 — Garcinia fragrans is Garcinia vidalii Merr.
15635 do.
8071 — Geunsia mollis is Premna nauseosa Blco.
16139 — Ginalloa dipterocarpae is Ginalloa ovata Dans.
15176 — Gloeocarpus philippinensis is Gloeocarpus patentivalvis (Radlk.) Radlk.
15058 do.
17061 — Gonocaryum cognatum magnum is Gonocaryum cognatum Elm.
17045 — Horsfieldia vulcanica is Horsfieldia ardisiaefolia (A. DC.) Warb.
17032 — Kadsura sorsogonensis is Kadsura philippinensis Elm.
15470 — Lepisanthes sorsogonensis is Nephelium intermedium Radlk.
15389 do.
17977 — Leptosolena auriculata is Leptosolena haenkei Presl
15993 — Litsea peninsula is Litsea luzonica (Blm.) Vill.
14984 — Loranthus ficii is Loranthus apoensis Elm.
15252 — Loranthus nervosa is Loranthus philippinensis C. & S.
15292 — Loranthus sorsogonensis is Loranthus cuernosensis Elm.
17328 — Loranthus vulcanicus is Loranthus merrillii Elm.

14664 — Macaranga utilis is Macaranga bicolor Muell.
17236 do.
14589 — Macaranga vulcanica is Macaranga tanarius (Linn.) Muell.
14409 do.
16521 — Maesa cuprifolia is Maesa longipetiolata Merr.
15224 — Maesa irosinensis is Maesa laxa Mez
14966 — Maesa vulcanica is Maesa denticulata Mez
16014 — Meliosma sorsogonensis is Meliosma multiflora Merr.
15322 — Meliosma tongcalingii is Meliosma macrophylla Merr.
14806 — Micromelum globosum is Murraya crenulata (Turcz.) Oliv.
14455 — Micromelum sorsogonense is Micromelum minutum (Forst.) Seem.
14533 do.
15669 — Microtropis rubra is Microtropis philippinensis Merr.
14367 do.
17092 — Mischocarpus vulcanicus is Mischocarpus sundaicus Blm.
17116 do.
8406 — Moschosma philippinense is Plectranthus diffusus Merr.
16010 — Myristica sorsogonensis is Myristica agusanensis Elm.
7377 — Myristica sulphurascens is Myristica simiarum A. DC.
16131 — Neotrewia arborea is Trichadenia philippinensis Merr.
15485 — Oncocarpus peninsula is Oncocarpus densiflora Merr.
17214 do.
16272 do.
15285 — Osmelia breviloculare is Osmelia conferta Benth.
17196 — Palaquium pacificum is Palaquium lanceolatum Blco.
16303 — Palaquium vulcanicum is Palaquium tenuipetiolatum Merr.
17223 — Parabaena dielsii is Tinomiscum philippinense Miers
12849 — Parinarium philippinense is Angelesia spendens Korth.
16896 — Polyscias floribunda is Polyscias nodosa (Blm.) Seem.
16711 — Premna subrotundifolia is Premna membranacea Merr.
15258 — Pygeum ovalis is Pygeum pubescens Merr.
15337 — Radermachera sorsogonensis is Radermachera brachybotrys Merr.
16797 — Rhododendron flaviflorum is Rhododendron leytense Merr.
16562 — Salacia angularis is Salacia prinoides (Willd.) A. DC.
12289 — Santiria luzonensis is Dracontomelum dao (Blco.) M. & R.
13071 — Santiria palawanensis is Santiria samarensis Merr.

14369 — Saurauia bulusanensis is Saurauia oligantha Merr.
16407 do.
16580 do.
15219 — Saurauia irosinensis is Saurauia latibractea Choisy
14581 do.
15281 — Saurauia vulcanica is Saurauia confusa Merr.
16187 do.
15518 do.
16348 — Sideroxylon bulusanensis is Sideroxylon velutinum Elm.
16109 do.
15596 do.
15184 — Spiraeopsis luzonensis is Spiraeopsis philippinensis Elm.
15571 — Strychnos lucbanensis is Strychnos luzonensis Elm.
17420 — Terminalia montalbanica is Terminalia polyantha Presl
17317 — Ternstroemia epiphytica is Adinandra urdanetensis Elm.
15851 do.
17573 — Tetrastigma lagunense is Tetrastigma harmandii Planch.
18173 — Tetrastigma merrittii is Tetrastigma harmandii Planch.
15303 — Tetrastigma sorsogonense is Tetrastigma harmandii Planch.
15958 do.
17716 — Toxocarpus maquilingensis is Ichnocarpus ovatifolia A. DC.
16536 — Trichosporum bulusanense is Trichosporum irigaense Merr.
14689 — Trichosporum sorsogonense is Trichosporum urdanetense Elm.
10949 — Trigonachras apoensis is Trigonachras brachycarpa Radlk.
15550 — Uvaria cardinalis is Uvaria rubra C. B. Rob.
15165 — Vandellia irosinensis is Lindernia crustacea (Linn.) Muell.
14794 — Zizyphus bulusanensis is Zizyphus cumingiana pilosa Merr.

LEAFLETS OF PHILIPPINE BOTANY

EDITED BY A. D. E. ELMER, M. A.

Vol. X | Manila, P. I., November 10, 1939 | Art. 137

PANDANUS UTILISSIMUS ELMER

(PLATE I)

by

A. D. E. ELMER

———x———

In the 1938 Philippine Carnival or Exposition held in this city, I noticed a leaf and fruit of a pandan on exhibition in the concession of the Bureau of Plant Industry under the name of *Pandanus sabotan Blco.* Knowing the fruit of this exhibited plant at sight, I felt that too great a confusion is created in the minds of those who were not aware of its true identity. For exposition purposes, the familiar trade name "Sabotan" and the big nanka or lanka like fruits are most interesting to the public. The scientific name of the fruit on exhibition is *Pandanus utilissimus Elm.*, not *Pandanus sabotan Blco.* To clarify this point is one of the purposes of this article.

The sabotan plant is well established in name and industry. It has been in cultivation 200 years or longer and is reported to be mainly planted in and around a number of towns located along the northeastern shore of Laguna de Bay region. *Robinson* states that it is also abundant in the vicinity of the barrios, often wild in the

MISSOURI BOTANICAL
RECEIVED
APR 19 1940

sense that it has been abandoned. The fact that no authentic flowers or fruits have yet been found or collected is no obstacle to its cultivation, as the plant bears numerous suckers at the base for transplanting. It yields a high grade of fibers in its leaves which the native women use in weaving fine expensive hats and small mats. One asks why, after such a long time has this useful plant remained so completely localized in its distribution? There are various grades of hats made from various fiber plants in the Philippines. *Robinson* estimates the cost as ranging from 6 centavos to perhaps 1,000 pesos per hat.

Generally speaking, the leaves of our Philippine pandans can be classified into three grades — the wide and long ones, the medium sized ones, and those with narrow leaves. In all cases the apical end portion of the blades is an important part for the taxonomic botanist to consider. The sabotan blades belong to the medium sized class of leaves with sharp spines along their edges and midrib, with tips that are very slenderly tapering, almost flagellate.

We have a very common and widely distributed seacoast plant called *Pandanus tectorius Sol.* with some varieties or forms, which bear leaves similar to those of *Pandanus sabotan Blco.* But, unlike *Pandanus sabotan Blco.*, it produces flowers and ample fruits. Possibly some of these forms or varieties of *Pandanus tectorius Sol.* also grow along the coast of Laguna de Bay, most certainly along the province of Rizal where I have seen them myself. As early as 1905 *Ahern's* native collector brought in a sterile specimen, number 2700, from Rizal province which *Merrill* at that time determined as *Pandanus sabotan Blco.* Later, in the discussion of this identification, *Count Ugolino Martelli* of Florence, Italy — the world specialist in this family, disagreeing with *Merrill's* determination, refers the above number, 2700, to a variety of *Pandanus tectorius Sol.* Furthermore, *Martelli* points out the vegetative differences

of *Pandanus sabotan Blco.*, and declared *Blanco's* plant a distinct species not yet identified as to flowers and fruits. This lack of fruits does not invalidate the use of *Blanco's* vernacular name sabotan for the specific name of the plant in question.

As a further mark of distinction between *Pandanus sabotan Blco.* and *Pandanus tectorius Sol.*, a few practical questions are offered for consideration. Do the women weavers ever collect the leaves of *Pandanus tectorius Sol.*, or its variety for their work in producing their excellent articles? Or do the Filipino weavers who depend upon this weaving industry for their living ever gather the fruits or suckers of *Pandanus tectorius Sol.* and plant them, depending upon their leaves for the future supply of their weaving materials?

Coming back to the scientific name of the fruiting specimen on exhibition, it is not *Pandanus sabotan Blco.* as already stated, but it is the very distinct and well known *Pandanus utilissimus Elm.* — originally discovered by me with mature fruits in 1906 near and in the vicinity of Lucban and published the same year in the Leaflets of Philippine Botany, volume I, page 80. In the concluding paragraph of my diagnosis, a brief description of the utility and preparation of its leaves was given. From the taxonomic stand point it is a most interesting and remarkable species of which *Martelli* writes, — "A splendid species, very characteristic because of the peculiar shape of its drupes. Another species which seem allied to it was discovered in British New Guinea."

This *Pandanus utilissimus Elm.*, my type specimen number 7379 belongs to the long and broad leafed species of pandans and bears a very different leaf tip than *Pandanus sabotan Blco.* It is never called sabotan by the Lucban people, is confined to the higher interior regions and bears an abundance of drupes arranged in a large cylin-

drical head similar in shape and appearance to the jak-fruit or *Artocarpus integrifolia Linn.* From its large leaves the weavers make rough mats, rice bags, coarse baskets and even hats. All these articles are of a different grade than those made from the fibers of the sabotan leaves.

A year after this first discovery of *Pandanus utilissimus Elm.*, *Curran* collected it at Majayjay for the Bureau of Forestry under number 8507 with ripe fruits. On January 3, 1909, *Robinson* recollected it in the same locality for the Bureau of Science under number 6542 and had a photograph made of an entire mature fruit or syncarpium (see plate I, with the determination and field data written along the side in his own hand writing). Since then no field worker collected typical specimens of it, either in its home environ or outside of it, until I collected mature specimens of it at Irosin in 1916, which material was distributed under my number 16366. More recently, from this same Sorsogon-Albay-Camarines Sur district the Bureau of Science collectors brought in specimen number 75647 from Catanduanes island, and number 76003 from the province of Camarines Sur. Both of these collections are in very young fruits, are commonly called karagomoy and exactly represent one and the same species. Even though these specimens are in young fruits there is no mistaking them as being any other species than *Pandanus utilissimus Elm.*, and by no stretch of imagination can they be classified as *Pandanus simplex Merr.*, so named in the herbarium.

Confusion has also arisen due to the fact that *Brown* and *Merrill* in their publications have subverted *Pandanus utilissimus Elm.* to *Pandanus simplex Merr.* which is incorrect. I do not contest *Merrill's* valid species, for I am convinced his fruits are specifically distinct from *Pandanus utilissimus Elm.* of Lucban. *Whitford* discovered the type number 782 of *Pandanus simplex Merr.* on a hill top near

the Pacific coast, province of Tayabas (Infanta) and gave it the common name as calaquimay which is not applied to the Lucban or Majayjay plants. The collector made no mention of any use of its leaves by the natives. *Merrill's* description of it is exceedingly short and incomplete. He states of his type specimen that it is an unbranched tree, which is an unusual character of our Philippine pandans. The distal end of the leaves is not described. He does not diagnose his fruit as young, but he indicates this in ink on the type sheet. His well cured drupes range from 1 to 3 cm in length, and together indicate more of a globose head rather than a cylindrical one. There is no similarity between the number, size, shape, shoulders and apical cap portion of his drupes and those of my type specimen number 7379 from Lucban, including the others from Majayjay and those more recently collected at Irosin.

In my opinion, *Merrill* made another error when he determined Bureau of Science number 20033 from Payauan, sub-province of Ifugao as *Pandanus utilissimus Elm.*, when at the same time he considered my species a synonym of *Pandanus simplex Merr.* *McGregor*, the collector of the above Bureau of Science number 20033, distinctly states in his field-note that his ellipsoid syncarp measures about 8 to 9 inches long, which is considerably less than one half as long or barely more than one third the length of those on *Pandanus utilissimus Elm.* On *McGregor's* specimen the drupes are mature, with apical points somewhat different from mine and are scarcely more than one half as long as those on my Lucban type specimen. He also secured a leaf tip which is different from that on my type.

Lately another interesting specimen of pandan fruit was collected on the Lapit river of Tayabas province, which fruit is ellipsoid in shape, is about 6 inches thick and 12 inches long. Its drupes, as well as those on *McGregor's*

specimen, unquestionably belong to the *Hombronia* section under which *Pandanus utilissimus Elm.* is placed by *Martelli.* Apparently there are several pandan species of the above section, ranging along the Pacific coast of Luzon, and which are quite distinct from one another.

Merrill further writes of my plant under his name as "A species remarkable for its enormous syncarps." I have already indicated the differences between his and my species. Botanists interested in the classification of these plants are requested to examine my cotype specimens with mature drupes, compare them with cotypes of *Pandanus simplex Merr.* which the author considers a young fruited specimen. But, are the drupes of *Merrill's* species young, and if so, are they anything like those on Bureau of Science numbers 75647 and 76003 which I have already cited as young *Pandanus utilissimus Elm.*? And will they be like the drupes described for my species from Lucban when mature? Writers on Philippine fiber plants and other local botanists have accepted *Pandanus utilissimus Elm.* for the plant I discovered, diagnosed and published — not the plant specimen *Merrill* had in hand from *Whitford's* collection. Yet, as late as 1915, an inaccuracy occurs in Bulletin number 54, pages 20 and 21, Bureau of Education, which clearly indicates rank confusion as to the identity of *Pandanus simplex Merr.* and *Pandanus utilissimus Elm.* The technical portion of botany in this bulletin was supplied by *Merrill,* according to the Foreword of the Acting Director of Education.

In 1920 *Brown* first blundered into an inexcusable printed mistake when he ignored *Pandanus utilissimus Elm.* by saying in a foot-note that it was a synonym of *Pandanus simplex Merr.* His figure 3 on page 335, volume I of Minor Products of Philippine Forests is typical *Pandanus utilissimus Elm.*, and his discussions under *Pandanus simplex Merr.* are therefore confusing and mislead-

ing. Botanical institutions have ample material of my cotype specimens in their herbaria, and can determine for themselves my view point or otherwise. To me it is a serious matter in systematic botany to supplant a mature specimen accurately described, both scientifically and economically, with one inadequately described and with leaves of no special economic importance. I cannot understand why *Pandanus utilissimus Elm.* was not reduced until seventeen years after its publication. During this long period of time my diagnosis and specimen were critically examined and field studies made by a number of local botanists. It was also under review of *Martelli* who, no doubt, clearly saw that it could not possibly fit the diagnosis nor the specimen of *Pandanus simplex Merr.* He declared my pandan plant from Lucban "A splendid species."

I have just called it a mistake, but it was not a mistake. If *Brown* had been a little more discriminating about specific characters he could have avoïded this tangle for himself. But he broke the ground for what was coming the following year, the appearance of the first volume of the Enumeration of Philippine Flowering Plants in which *Merrill* reduced *Pandanus utilissimus Elm.* to *Pandanus simplex Merr.*, which reduction should not have been made and must be corrected.

There is not the least doubt in my mind that *Pandanus utilissimus Elm.* will stand because it was drawn up from a different kind of a pandan species than that drawn up for *Pandanus simplex Merr.*

Important references

Blanco—Fl. Filip. (1837) 779 and edition.

Brown—Bur. of Forestry, Minor Products of Philippine Forests, vol. I, no. 22 (1920) 334 and 336 including the figures.

Elmer—Leafl. Philip. Bot. vol. I (1906) 80.

Martelli—Bur. of Science, The Philippine Species of Pandanus, Philip. Journ. Sci., vol. III (1908) 62 and 67.

Martelli—Webbia no. 4[1] (1913) 31 and 36 with tablets.

Merrill—Bur. Govt. Lab. Publ. no. 29 (1905) 6.

Merrill—Bur. of Science, An Enumeration of Philippine Flowering Plants, vol. I (1925) 20.

Miller—Bur. of Education, Philippine Hats, Bulletin no. 33 (1910).

Miquel—Fl. Ind. Bat. 3 (1856) 166.

Muller—Bur. of Education, Industrial Fiber Plants of the Philippine Islands, Bulletin no. 49 (1913).

Robinson—Bur. of Science, Philippine Hats, Philip. Journ. Sci., vol. VI (1911) 103 and 104.

Warburg—in Engler Pflanzenreich 3 (1900) 84.

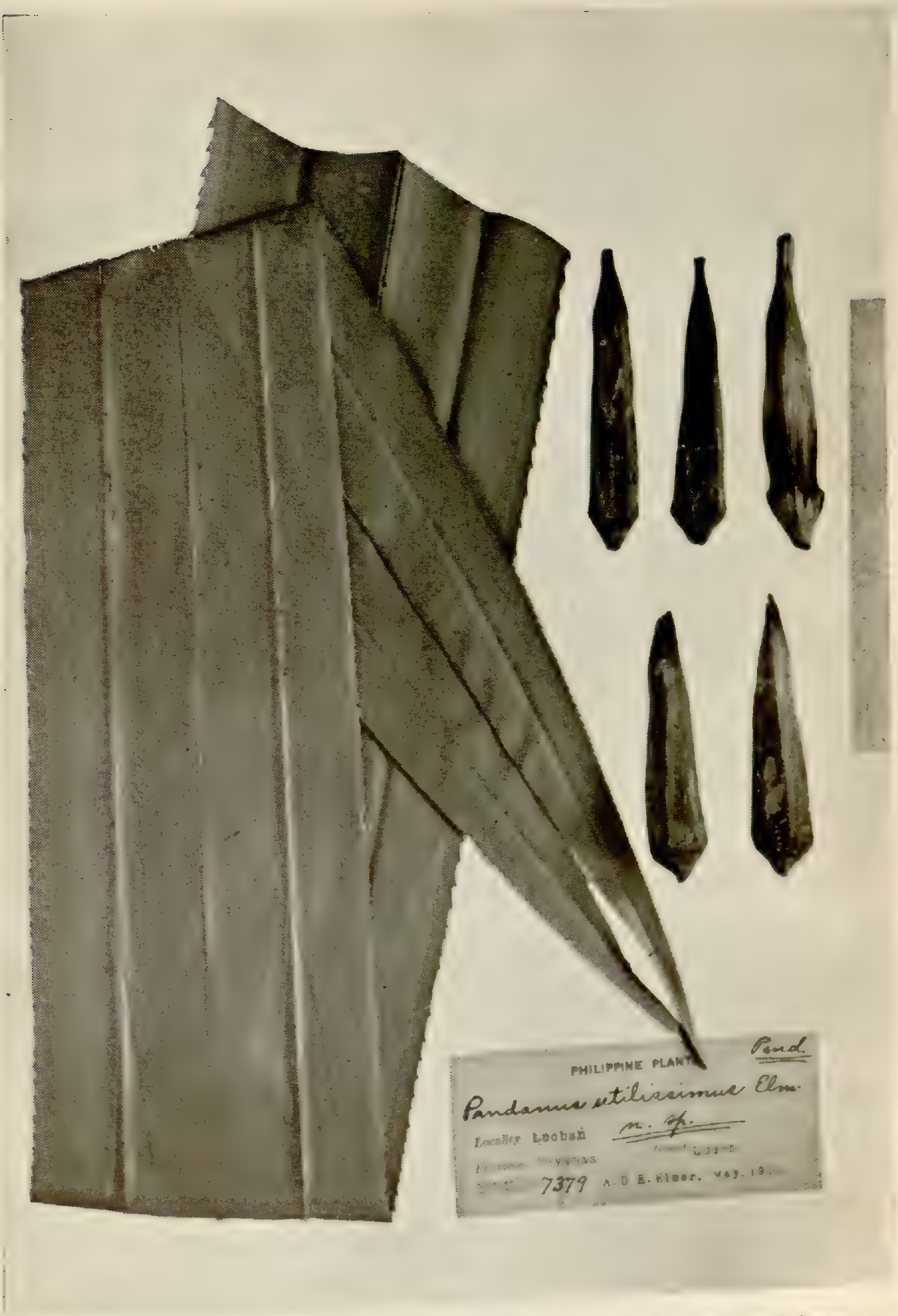
Bur. of Education, A Handbook of Industrial Plants in Common Use, Bulletin no. 54 (1915) 20 and 21.

Index Kewensis.

Courtesy Bureau of Science

Syncarpium of Pandanus utilissimus Elmer
(See plate II)

PLATE II



* Courtesy The National History Museum Division, Department of Agriculture and Commerce

Leaf and drupes of Pandanus utilissimus Elmer
(See plate III for Pandanus simplex Merrill)

* Formerly in Bureau of Science

PLATE III

* *Courtesy The National History Museum Division, Department of Agriculture and Commerce*

Leaf and drupes of Pandanus simplex Merrill

* Formerly in Bureau of Science

ERRATA — VOL. X

P. 3507, ll. 5 and 14 from bottom for manuel read manual.
P. 3538, l. 2 from bottom for gracillina read gracillima.
P. 3568, l. 9 from top for brancoes read branches.
P. 3591, l. 6 from top for egdes read edges.
P. 3617, l. 9 from bottom for Colocasia write Calocasia.
P. 3744, l. 7 from bottom for *Cyrtandra sibulanensis* write *Cyrtandra sibuyanensis*.
P. 3809, l. 10 from bottom for spendens read splendens.
Through an error and oversight the description of *Freycinetia pandanicarpa Elm.* n. sp. on page 3607 must be superceded by *Freycinetia pandanicarpa Elm.* n. sp. on page 3773.

14

INDEX — VOL. X

A

Actinodaphne *conferta* 3751
copelandii 3750
Adinandra urdanetensis 3810
Agelaea *everettii* 3718
platyphylla 3717
Aglaonema alpinum 3611
commutatum 3612
latifolium 3613
oblongifolium 3612
philippinense 3613
Alocasia heterophylla 3613
heterophylla 3701
macrorrhiza 3614
macrorrhiza 3615
maquilingensis 3615
talihan 3614
urdanetensis 3699
vulcanica 3616
zebrina 3616
Alpina luteo-carpa 3803
Alsomitra gracilipes 3722
integrifoliola 3723
Alyxia *confertiflora* 3694
monilifera 3694
quadrata 3692
Amorphophallus campanulatus 3617
Andropogon aciculatus 3509
Angelesia *splendens* 3809
Anodendron *corymbosum* 3594
Antidesma *curranii* 3733
frutiferum 3731
Apluda mutica 3509
Aporosa *sphaeridophora* 3807
Ardisia *cuprea* 3765
disticha 3765
pardalina 3807
peninsula 3764
philippinensis 3765
squamulosa 3807
tomentosa 3765
Artabotrys stolonifera 3684
Artocarpus *integrifolia* 3814
ovatifolia dolichostachya 3807
Arundinella *miliacea* 3807
Asclepias curassavica 3547
Astrocalyx calycina 3649
Astronia *acuminatissimum* 3658
avellanea 3649
badia 3651
bicolana 3651
bicolor 3651
bulusanensis 3653
candolleana 3654
consanguinea 3654
discolor 3651
gitingensis 3657
glauca 3657
lagunensis 3655
loheri 3655
maquilingensis 3651
pacifica 3654
piperi 3655
platyphylla 3654
pulchra 3652
purpuriflora 3656
purpuriflora 3652
ramosii 3657

sorsogonensis 3658
viridifolia 3652, 3657

B

Baccaurea *tetrandra* 3807
Beccarianthus ickisii setosus 3658
Begonia bakeri 3706
binuangensis 3807
copelandii 3707
contracta 3709
palawanensis 3709
pseudo-lateralis 3807
purpurea 3707
sorsogonensis 3708
Boea philippinensis 3807
Buchanania conglomerata 3679
conglomerata 3682
nitida 3681, 3682
platyphylla 3682
sorsogonense 3681
Bulbostylis barbata 3525

C

Callicarpa *bicolor* 3798
nana 3798
subcandida 3797
Calocasia esculentum 3617
Calophyllum sorsogonense 3744
zschokkei 3745
Canarium antonii 3711
costulatum 3714
gracile 3712
longiflorescens 3713
nervosum 3714
Capparis *oblongata* 3807
viridis 3807
Carex breviscapa 3525
cryptostachys 3526
cumingii 3528
nodiflora 3528
nodiflora 3526
rafflesiana 3526
vulcanica 3526
Casearia elliptifolia 3738
loheri 3739
Celtis *luzonica* 3797
mindanaensis 3797
multifolia 3796
philippensis 3797
Centotheca latifolia 3509
Centrostemma multiflorum 3547
Cephaloschefflera catanduanensis 3639
Ceropegia cumingiana 3548
Chloris barbata 3510
Cissus *assamica* 3807
Clausena palawanensis 3781
todayensis 3782
Clemensiella *dischidioides* 3549
mariae 3548
Codiaeum *luzonicum* 3807
Columella *geniculata* 3801
irosinensis 3799
Conchophyllum *copelandii* 3570
elmeri 3549
elmeri 3587
merrillii 3570
Connarus *carnosus* 3719
fragrans 3807
oliganthus 3718
palawanensis 3719
trifoliatus 3807
whitfordii 3719
Cratoxylon *blancoi* 3807
Creochiton diptera 3659
Crypteronia *cumingii* 3807
Cryptocarya *cinnamomifolia* 3755
foxworthyi 3752
pacifica 3753
parvifolia 3753
trinervia 3754
villarii 3807
zamboangensis 3754

Cryptolepis javanica 3549
Cyanotis brunnea 3714
capitata 3715
moluccana 3715
Cynanchum denigratum 3549
physocarpum 3551
schlechterianum 3551
Cyperus difformis 3528
diffusus 3528
eragrostis 3529
haspan 3529
iria 3529
pilosus 3530
radiatus 3530
rotundus 3530
silletensis 3530
zollingeri 3531
Cyrtandra *glaucescens* 3743
humilis 3743
membranifolia 3742
peninsula 3741
sibulanensis 3744, 3819
sibuyanensis 3819
umbrina 3742
vulcanica 3743
williamsii 3807
Cyrtosperma merkusii 3618

D

Dactyloctenium aegyptenium 3510
Dichroa *platyphylla* 3807
Digitaria *consanguinea* 3511
corymbosa 3511
longiflora 3511
sanguinalis 3512
sanguinalis 3511
Dinochloa scandens 3512
Diospyros *pilosanthera* 3807
Dipterocarpus *warburgii* 3572
Dischidia apoensis 3551
copelandii 3553
copelandii 3567
diphylla 3553
elmeri 3555
glaucescens 3553
hirsuta 3556
hirsuta 3560
irosinensis 3556
irosinensis 3561
joloensis 3553
lancifolia 3558
livida 3558
merrillii 3560
merrillii 3560
merrillii angusta 3569
miniata 3558
myrtillus 3564
oiantha 3561
oiantha 3558
palawanensis 3561
palawanensis 3590
platyphylla 3546, 3566
platyphylla 3563
pubicaulis 3567
purpurea 3555, 3566
purpurea 3563
rosea 3563
ruscifolia 3564
saccata 3546, 3562, 3590
sorsogonensis 3564
striata 3566
sylvestrin 3568
tonsa 3558, 3583
Dischidiopsis copelandii 3569
incrassata 3570
luzonica 3570
parasitica 3570
ramosii 3570
Discocalyx *congestiflora* 3808
linearifolia 3808
Dissochaeta acmura 3659
Dracontomelum *dao* 3809

E

Elaeagnus *philippinensis* 3808
Elaeocarpus *argenteus* 3730
merrillii 3729
Eleocharis equisetina 3531
retroflexa 3531
Eleusine indica 3512
Endospermum *peltatum* 3808
Entada phaseoloides 3808
Epipremnopsis huegeliana 3619
Epipremnum *angustilobum* 3621
elmerianum 2624
glaucicephalum 3620
luzonense 3623
miniatum 3622
miniatum 3624
multicephalum 3624
philippinense 3624
pinnatum 3626
robinsonii 3626
sorsogonense 3624
truncatum 3626
Eragrostis *tenella* 3513
viscosa 3513
unioloides 3512
Eugenia *arcuatinervia* 3808
balerensis 3768
everettii 3808
irosinensis 3767
livida 3808
luzonensis 3770
obliquinervia 3768
peninsula 3769
perpallida 3808
saligna 3808
tripinnata 3770

F

Fagraea cardinalicarpa 3759
Ficus agusanensis 3762
integrifolia 3753
paucinervia 3763
Fimbristylis acuminata 3532
annua 3532
complanata 3532
diphylla 3532
globulosa 3533
globulosa 3533
meliacea 3533
quinquangularis 3533
utilis 3533
Flacourtia *lanceolata* 3808
Freycinetia *acutifolia* 3808
brevifolia 3771
bulusanensis 3601
cuernosensis 3602
curranii 3602
irosinensis 3602
jagorii 3604
jagorii 3775
luteo-carpa 3604
maxima 3606
membranifolia 3606
multiflora 3606
negrosensis 3607
pandanicarpa 3607, 3773
pandanicarpa 3819
rostrata 3610
scabripes 3604, 3808
sphaerocephala 3610
sphaerocephala 3775
sorsogonensis 3608
subflagellata 3608
superba 3608
surigaoensis 3774
vulcanica 3601
warburgii 3610
Fuirena ciliaris 3533
umbellata 3534

G

Garcinia bulusanensis 3746
gynotrochoides 3747
lateriflora 3747

samarensis 3748
sulphurea 3748
vidalii 3808
Garnotia stricta 3513
Ginalloa ovata 3808
Glochidion *canescens* 3735
pubicarpum 3733
robinsonii 3734
sorsogonense 3734
Gloeocarpus *patentivalvis* 3808
Gomphandra *cumingiana* 3749
sorsogonensis 3748
Gonocaryum cognatum 3808
Gymnanthera pedunculata 3571
Gymnema *cumingii* 3571
lignosum 3571
mariae 3594
schlechteriana 3571
tingens 3571
Gynura labiensis 3715
vidaliana 3716

H

Hedyotis *banksii* 3780
elmeri 3780
pinatubensis 3778
Hemigraphis *bakeri* 3674
diversifolia 3673
diversifolia 3676
fruticulosa 3674
subtinctoria 3674
Heterostemma angustilobum 3571
herbertii 3572
lucbanensis 3572
Homalomena philippinensis 3626
Horsfieldia *ardisiaefolia* 3808
gigantifolia 3763
Hoya angustifolia 3572
angustisepala 3585
benguetense 3574
bilobata 3577
bordenii 3574
bordenii 3575
bulusanensis 3575
cagayanensis 3583
camphorifolia 3577
ciliata 3577
ciliata 3586, 3590
coronarioides minor 3590
crassicaulis 3579
crassicaulis 3581
cumingiana 3581
darwinii 3546
diversifolia 3577
eugenioides 3588
gracilis 3581
gracilis 3587
imbricata 3546, 3566
imbricata basicordata 3581
incrassata 3581
incrassata 3580, 3590
intermedia 3574
leytensis 3582
longipes 3577
luzonica 3584
macgregorii 3583
macgregorii 3587
meliflua 3584
mindanaensis 3584
mindorensis 3586
obscura 3583
obscura 3586
odorata 3587
pubifera 3588
pulgarensis 3589
pulgarensis 3590
quinquenervia 3591
rotundisepala 3579
Hypolytrum *philippense* 3534
scirpoides 3534

I

Ichnocarpus *ovatifolia* 3810
Imperata exaltata 3513
Ischaemum digitatum 3514

intermedium 3514
Ischnostemma carnosum 3591
Ixonanthes philippinense 3758
reticulata 3759

K

Kadsura *philippinensis* 3808
Kibatalia fragrans 3694
Kickxia *macgregorii* 3695
Kyllinga brevifolia 3534
monocephala 3535

L

Leea bulusanensis 3801
luzonensis 3802
manillensis 3802
negrosensis 3802
Leptaspis urceolata 3514
Leptosolena *haenkei* 3808
Lindernia *crustacea* 3810
Litsea bulusanensis 3755
fulva 3756
luzonica 3756, 3808
Lophatherum gracile 3515
Loranthus *apoensis* 3808
cuernosensis 3808
merrillii 3808
philippinensis 3808
Lunasia *amara* 3783
philippinensis 3783
reticulata 3783
truncata 3782

M

Macaranga *bicolor* 3809
tanarius 3809
Maesa *denticulata* 3809
irosinensis 3765
laxa 3809
longipetiolata 3766, 3809
megaphylla 3767
platyphylla 3767
undulata 3767
Mapania alpina 3535
banahaensis 3537
gracillima 3538
humilis 3537
humilis 3538
kurzii 3537
rostrata 3538
Mariscus pennatus 3538
stuppeus 3538
Marsdenia tinctoria 3591
Medinilla *affinis* 3666
attenuata 3664
bakeri 3660
bulusanensis 3661
canlaonensis 3668
cumingii 3662
curtiflora 3662
disparifolia 3664
epiphytica 3664
involucrata 3664
megacarpa 3666, 3669
myrtiformis 3662
myrtiformis 3664
nodiflora 3661
nodiflora 3664
pachyphylla 3665
peltata 3666
peninsula 3667
piperoides 3668
purpurea 3669
subsessilis 3668
subumbellata 3666
Melastoma polyanthum 3669
setosum 3670
Meliosma apoensis 3784
brachybotrys 3786
cannarioides 3785
macrocarpa 3786
macrophylla 3788, 3809
megalobotrys 3786
multiflora 3809

sumatrana 3785
Memecylon agusanense 3670
cumingii 3670
lanceolatum 3671
sorsogonense 3671
Mezoneurum cabadbarense 3757
latisiliquum 3758
Micromelum *minutum* 3809
Microphium palawanense 3739
Microtropis *philippinensis* 3809
Miscanthus japonicus 3515
Mischocarpus *sundaicus* 3809
Mitrephora *basilanensis* 3687
multifolia 3685
pictiflora 3688
sorsogonensis 3687
Murraya *crenulata* 3809
Mussaenda *anisophylla* 3781
milleri 3780
Myristica *agusanensis* 3809
simiarum 3809

N

Nephelium *intermedium* 3808

O

Oncocarpus *densiflora* 3809
Ophiurus exaltatus 3516
Oplismenus undulatifolius 3516
compositus 3516
Orophea vulcanica 3688
Oryza *latifolia* 3517
minuta 3517
sativa 3517
Osbeckia chinensis 3671
Osmelia *conferta* 3809

P

Palaquium *ahernianum* 3789
aureum 3788
barnesii 3790
lanceolatum 3809
sorsogonense 3789
tenuipetiolatum 3809
Pandanus *brevistipes* 3776
sabotan 3811, 3812, 3813
simplex 3814, 3815, 3816, 3817
tectorius 3812, 3814
urdanetensis 3775
utilissimus 3811
utilissimus 3811, 3813, 3814, 3815, 3816, 3817
Panicum amplexicaule 3517
auritum 3518
colonum 3518
crus-galli 3519
cumingianum 3518
indicum 3519
malabaricum 3519
palmaefolium 3524
patens 3520
pilipes 3520
Papualthia *bakeri* 3690
irosinensis 3689
Paramapania rostrata 3538
rostrata 3538
Parsonsia aterinervia 3695
confusa 3696
magnifolia 3696
philippinensis 3698
urdanetensis 3696
Paspalum conjugatum 3520
longifolium 3521
Pennisetum macrostachyum 3521
Phragmites vulgaris 3521
Pistia stratiotes 3627
Plagiostachys lata 3805
Plectranthus *diffusus* 3809
Pogonanthera reflexa 3672
Pogonatherum paniceum 3522
Polyalthia pacifica 3620
romblonensis 3691
Polyosma *apoensis* 3791
lagunensis 3791

sorsogonensis 3790
Polyscias *nodosa* 3809
Polytrema irosinensis 3676
macgregorii 3677
philippinensis 3677
Pothoidium lobbianum 3627
Pothos *clemensii* 3628
inaequilaterus 3630
ovatifolius 3628
peninsularis 3628
philippinensis 3630
rumphii 3628
rumphii 3628
Premna *membranacea* 3809
nauseosa 3808
Pygeum pubescens 3809
Pyrenacantha *repanda* 3808

Q

Quercus bulusanensis 3736
philippinensis 3738
pruinosa 3566

R

Radermachera *brachybotrys* 3809
elmeri fragrans 3711
punctata 3709
Raphidophora bulusanensis 3630
elmeri 3631
merrillii 3621
monticola 3631
rigida 3632
Rhododendron *leytense* 3809
Rivea *glabrata* 3721
leucocarpa 3720
luzonensis 3721
sorsogonensis 3721
Rottboellia exaltata 3522
tongcalingii 3516
Rubus *benguetensis* 3778
edanoi 3778
sorsogonensis 3777

S

Saccharum spontaneum 3523
Salacia *prinoides* 3809
Santiria *samarensis* 3809
Sarcostemma brunonianum 3592
Sarcostigma *philippinensis* 3750
surigaoensis 3749
Saurauia bulusanensis 3726
confusa 3810
cumingiana 3728
irosinensis 3727
latibractea 3728, 3810
oligantha 3727, 3810
sparsiflora 3727
Schefflera *auranticarpa* 3641
bulusanensis 3637
catanduanensis 3639
caudatifolia 3639
chartacea 3638
cumingii 3640
decidua 3641
elliptifoliola 3640
insularum 3641
longifructescens 3641
longifructescens 3705
longispicata 3642
luzonica 3638, 3647
mellifera 3639
multicaulis 3640
obliqua 3645
pentaphylla 3642
piperoidea 3643
populnea 3644
simplicifolia 3645, 3647
sorsogonensis 3646
todayensis 3704
trifoliata 3643
urdanetensis 3639
Secamone multiflora 3592
rectinervis 3592
urdanetensis 3592
Semecarpus *subsessilifolia* 3683

testaceus 3682
Setaria *flava* 3524
geniculata 3523
palmifolia 3524
Schismatoglottis hastata 3701
irosinensis 3632
irosinensis 3634
latifolia 3634
luzonensis 3634
mindanaoana 3702
minor 3702
Schizostachyum lumampao 3523
Scindapsus curranii 3635
fragilis 3702
hederaceus 3635
Scirpus erectus 3539
grossus 3539
mucronatus 3539
Scleria *bulusanensis* 3540
hebecarpa 3539
lithosperma 3540
motleyi 3542
multifoliata 3540
purpureo-vaginata 3540
scrobiculata 3540
sorsogonensis 3541
subrostrata 3542
trigona 3542
Sideroxylon *velutinum* 3810
Streptocaulon baumii 3594
corymbosum 3594
cumingii 3594
Strobilanthes bulusanensis 3678
Strombosia minor 3770
philippinensis 3771
Strychnos *luzonensis* 3810
Spiraeopsis *philippinensis* 3810
Spondias romblonensis 3683
Sporobolus indicus 3524
Symplocos *acuminatissima* 3793
bulusanensis 3792
polyandra 3794
salix 3793
verdifolia 3793
villarii 3794

T

Tacca *elmeri* 3795
weberi 3794
Telosma crispipetala 3595
parviflora 3596
procumbens 3596
Terminalia *polyantha* 3810
Tetrastigma *harmandii* 3803, 3810
lanceolarium 3803
silvestrei 3802
strumarum 3803
Themeda gigantea 3525
Thysanolaena maxima 3525
Tinomiscum *philippinense* 3809
Tinospora hastata 3760
negrotica 3762
Torulinium ferax 3542
Toxocarpus glaucus 3597
glaucus 3597
gracilis 3597
merrillii 3597
rubricaulis 3597
sorsogonensis 3598
Trichadenia *philippinensis* 3809
Trichosporum *irigaense* 3810
urdanetense 3810
Trigonachras *brachycarpa* 3810
Trigonostemon bulusanensis 3735
philippinensis 3736
Tylophora clemensiae 3598
elmeri 3598
floribunda 3598
lucida 3598
luzonica 3598
merrillii 3599
perrottetiana 3599
setosa 3599

U

Urandra *sorsogonensis* 3749
Uvaria peninsula 3691
rubra 3810
scandens 3692
zschokkei 3692

V

Vaccinium *barandanum* 3731
philippinense 3731
sorsogonense 3730
Vitex bulusanensis 3798
curranii 3799

W

Weinmannia bulusanensis 3723
camiguinensis 3724, 3726
irosinensis 3725
Wrightia *calycina* 3699
sorsogonensis 3698

X

Xanthophyllum *affine* 3777
flavo-virens 3776

Z

Zizyphus *cumingiana pilosa* 3810

STATEMENT

Regarding my type specimens.

The type specimens of my new Philippine species of plants discovered and published in the *Leaflets of Philippine Botany* are preserved in my private type collection. This study set of my collection also contains most of the cotype specimens of other authors who so kindly assisted me in my work.

A. D. E. Elmer

Manila, P. I.

CONTENTS OF VOLUMES

Number of articles, pages and years.

VOLUME I:—

Title - page Contents Articles 1 - 16 Errata 360 Index 364	pages 1 - 359 years 1906 - 1908

VOLUME II:—

Title - page Contents Articles 17 - 43 Errata 741 Index 745	pages 375 - 740 years 1908 - 1910

VOLUME III:—

Title - page Contents Articles 44 - 60 Errata 1133 Index 1135	pages 759 - 1132 years 1910 - 1911

VOLUME IV:—

Title - page Contents Articles 61 - 75 Errata 1521 Index 1523	pages 1149 - 1520 years 1911 - 1912

VOLUME V:—

Title - page Contents Articles 76 - 94 Errata 1907 Index 1909	pages 1533 - 1906 years 1912 - 1913

VOLUME VI:—

Title - page
Contents
Articles 95 - 108
Errata 2295
Index 2297

pages 1919 - 2294
years 1913 - 1914

VOLUME VII:—

Title - page
Contents
Articles 109 - 114
Errata 2701
Index 2703

pages 2319 - 2700
years 1914 - 1915

VOLUME VIII:—

Title - page
Contents
Articles 115 - 121
Errata (3107)
Index (3109)

pages 2719 - 3106
years 1915 - 1919

VOLUME IX:—

Title - page
Contents
Articles 122 - 129
Errata 3489
Index 3491

pages 3107 - 3488
years 1920 - 1937

VOLUME X:—

Title - page
Contents
Articles 130 - 137
Errata 3819
Index 3821
Statement 3831
Contents of volumes 3833
List of authors 3835
General index (in preparation)

pages 3507 - 3818
years 1938 - 1939

LIST OF AUTHORS

Names of articles with citations.

AMES, OAKES — Orchidaceae Novae et Criticae Insularum Philippinarum —
Volume V, article 77, page 1549, date of publication December 12, 1912.

BAKER, C. F. — The Lower Fungi of the Philippine Islands. A bibliographic list chronologically arranged, and with localities and hosts —
Volume VI, article 102, page 2065, date of publication January 14, 1914.

" — First supplement to the list of The Lower Fungi of the Philippine Islands —
Volume VII, article 113, page 2417, date of publication November 14, 1914.

BECCARI, O. — New or Little-known Philippine Palms —
Volume II, article 36, page 639, date of publication July 30, 1909.

" — Palms of the Philippine Islands. Collected and distributed by *A. D. E. Elmer* —
Volume VIII, article 120, page 2997, date of publication August 25, 1919.

BROTHERUS, V. F. — Musci Novi Philippinenses - I —
Volume II, article 37, page 651, date of publication September 9, 1909.

" — Musci Novi Philippinenses - II —
Volume VI, article 99, page 1973, date of publication December 1, 1913.

CANDOLLE, AUG. DE — Revision of the Philippine Species of Elaeocarpus —
Volume II, article 35, page 633, date of publication May 29, 1909.

CANDOLLE, CASIMIR DE — Philippine Piperaceae —
Volume III, article 44, page 759, date of publication October 31, 1910.

" — Six New Piperaceae —
Volume VI, article 108, page 2291, date of publication July 3, 1914.

CHRISTENSEN, CARL — Report of Mount Pinatubo Ferns. Collected in May, 1927 by *A. D. E. Elmer* —
Volume IX, article 124, page 3139, date of publication April 20, 1933.

COPELAND, E. B. — A New Polypodium and Two Varieties —
Volume I, article 5, page 78, date of publication July 26, 1906.

" — Some New and Critical Ferns —
Volume I, article 13, page 233, date of publication November 6, 1907.

" — Pteridophytes of the Horn of Negros —
Volume II, article 19, page 387, date of publication October 30, 1908.

" — The Ferns of Mount Apo —
Volume III, article 45, page 791, date of publication November 15, 1910.

" — New Ferns from Sibuyan —
Volume IV, article 61, page 1149, date of publication October 7, 1911.

" — Some Ferns of North-eastern Mindanao —
Volume V, article 90, page 1679, date of publication June 28, 1913.

" — Few New Ferns from Mt. Bulusan —
Volume IX, article 122, page 3107, date of publication March 9, 1920.

DIELS, L. — Synopsis of the Philippine Menispermaceae —
Volume IV, article 63, page 1161, date of publication November 13, 1911.

ELMER, A. D. E. — Philippine Rubiaceae —
Volume I, article 1, page 1, date of publication April 8, 1906.

" — A Fascicle of Benguet Figs —
Volume I, article 2, page 42, date of publication April 10, 1906.

" — Additional New Species of Rubiaceae —
Volume I, article 3, page 63, date of publication April 12, 1906.

" — Pandans of East Leyte —
Volume I, article 4, page 74, date of publication April 15, 1906.

" — New Pandanaceae from Mt. Banahao —
Volume I, article 6, page 80, date of publication August 1, 1906.

" — Manual of the Philippine Compositae —
Volume I, article 7, page 83, date of publication August 16, 1906.

" — A Fascicle of East Leyte Figs —
Volume I, article 8, page 187, date of publication December 10, 1906.

" — Freycinetia from Lucban —
Volume I, article 11, page 212, date of publication October 14, 1907.

" — Some New Leguminosae —
Volume I, article 12, page 220, date of publication October 21, 1907.

" — A Fascicle of Tayabas Figs —
Volume I, article 14, page 236, date of publication November 15, 1907.

" — A Century of New Plants —
Volume I, article 16, page 272, date of publication January 25, 1908.

ELMER, A. D. E. — Some Interesting Lauraceae —
Volume II, article 17, page 375, date of publication September 12, 1908.

" — Six Undescribed Species of Macaranga —
Volume II, article 20, page 427, date of publication November 3, 1908.

" — Six New Myrsinaceae —
Volume II, article 22, page 439, date of publication November 7, 1908.

" — Synopsis of Rubus —
Volume II, article 23, page 445, date of publication November 23, 1908.

" — Three Score of New Plants —
Volume II, article 24, page 463, date of publication December 14, 1908.

" — The Genus Itea —
Volume II, article 25, page 527, date of publication December 16, 1908.

" — A Fascicle of South Negros Figs —
Volume II, article 26, page 531, date of publication December 23, 1908.

" — Gesneriaceae from the Cuernos Mts. —
Volume II, article 27, page 553, date of publication December 27, 1908.

" — A Score of New Plants —
Volume II, article 29, page 573, date of publication February 15, 1909.

" — Synopsis of Fagraea —
Volume II, article 30, page 595, date of publication February 23, 1909.

" — Synopsis of Artocarpus —
Volume II, article 32, page 609, date of publication March 15, 1909.

ELMER, A. D. E. — The Genus Hydrocotyle —
Volume II, article 33, page 627, date of publication March 20, 1909.

" — A New Grewia —
Volume II, article 34, page 631, date of publication March 22, 1909.

" — Myrsinaceae from Mount Apo —
Volume II, article 38, page 659, date of publication August 5, 1910.

" — A Decade of New Plants —
Volume II, article 39, page 677, date of publication August 8, 1910.

" — A New Genus and New Species of Leguminosae —
Volume II, article 40, page 689, date of publication August 31, 1910.

" — Lauraceae from Mt. Apo and Mt. Giting-giting —
Volume II, article 41, page 703, date of publication September 23, 1910.

" — The Genus Solanum from Mount Apo —
Volume II, article 42, page 729, date of publication October 3, 1910.

" — New Species of Begonia —
Volume II, article 43, page 735, date of publication October 8, 1910.

" — Three New Cyperaceae —
Volume III, article 46, page 853, date of publication November 26, 1910.

" — Notes on Fagraea —
Volume III, article 47, page 857, date of publication November 29, 1910.

ELMER, A. D. E. — The Callicarpae of Mount Apo —
Volume III, article 48, page 861, date of publication December 5, 1910.

" — Sapotaceae from Sibuyan Island —
Volume III, article 49, page 867, date of publication December 10, 1910.

" — Urticaceae from the Vicinity of Mount Apo —
Volume III, article 50, page 875, date of publication December 15, 1910.

" — Euphorbiaceae Collected on Sibuyan Island —
Volume III, article 51, page 903, date of publication December 23, 1910.

" — The Oaks of Mount Apo —
Volume III, article 52, page 933, date of publication December 27, 1910.

" — New and Interesting Gesneriaceae —
Volume III, article 53, page 947, date of publication December 31, 1910.

" — New and Noteworthy Rubiaceae —
Volume III, article 54, page 971, date of publication January 11, 1911.

" — Garcinia from Sibuyan Island —
Volume III, article 55, page 1047, date of publication January 25, 1911.

" — Notes on Myristicaceae —
Volume III, article 56, page 1057, date of publication January 27, 1911.

" — Loranthus in the Vicinity of Mount Apo —
Volume III, article 57, page 1067, date of publication January 28, 1911.

ELMER, A. D. E. — The Genus Canarium of Mount Apo —
Volume III, article 58, page 1077, date of publication January 30, 1911.

" — The Ericaceae of Mount Apo —
Volume III, article 59, page 1089, date of publication January 31, 1911.

" — Additional Species of Elaeocarpus —
Volume IV, article 65, page 1171, date of publication November 15, 1911.

" — New Melastomataceae —
Volume IV, article 66, page 1191, date of publication November 29, 1911.

" — A Fascicle of Davao Figs —
Volume IV, article 67, page 1231, date of publication December 19, 1911.

" — Euphorbiaceae Collected on Palawan Island —
Volume IV, article 68, page 1271, date of publication December 23, 1911.

" — A Fascicle of Sibuyan Figs —
Volume IV, article 69, page 1307, date of publication December 29, 1911.

" — Palawan Rubiaceae —
Volume IV, article 70, page 1327, date of publication January 22, 1912.

" — A Fascicle of Palawan Figs —
Volume IV, article 71, page 1363, date of publication February 26, 1912.

" — Notes and Descriptions of Eugenia —
Volume IV, article 72, page 1399, date of publication March 13, 1912.

" — New Apocynaceae —
Volume IV, article 73, page 1445, date of publication March 18, 1912.

ELMER, A. D. E. — Four New Dipterocarpaceae —
Volume IV, article 74, page 1469, date of publication March 22, 1912.

" — Two Score of New Plants —
Volume IV, article 75, page 1475, date of publication April 20, 1912.

ELMER, A. D. E. & FOCKE, W. O. — Two New Species of Rubus —
Volume V, article 80, page 1617, date of publication May 28, 1913.

ELMER, A. D. E. — Philippine Pygeum —
Volume V, article 81, page 1621, date of publication May 30, 1913.

" — Philippine Gyrinopsis —
Volume V, article 82, page 1629, date of publication June 2, 1913.

" — Philippine Polyosma —
Volume V, article 83, page 1633, date of publication June 5, 1913.

" — Philippine Trichospermum —
Volume V, article 84, page 1641, date of publication June 7, 1913.

" — Philippine Curculigo —
Volume V, article 85, page 1645, date of publication June 9, 1913.

" — Philippine Linociera —
Volume V, article 86, page 1651, date of publication June 10, 1913.

" — Philippine Balanophora —
Volume V, article 87, page 1659, date of publication June 13, 1913.

" — Philippine Ilex —
Volume V, article 88, page 1663, date of publication June 16, 1913.

ELMER, A. D. E. — A Few New Polygalaceae —
Volume V, article 89, page 1671, date of publication June 21, 1913.

" — Palawan Acanthaceae —
Volume V, article 91, page 1685, date of publication July 3, 1913.

" — New Anonaceae —
Volume V, article 92, page 1705, date of publication July 19, 1913.

" — Four Score of New Plants —
Volume V, article 93, page 1751, date of publication August 18, 1913.

" — Rubiaceae from Mount Urdaneta —
Volume V, article 94, page 1855, date of publication September 12, 1913.

" — Loranthus from Mount Urdaneta —
Volume VI, article 98, page 1959, date of publication November 29, 1913.

" — Seven Oaks from Mount Urdaneta —
Volume VI, article 100, page 1981, date of publication December 6, 1913.

" — New Symplocos from Mindanao —
Volume VII, article 109, page 2319, date of publication August 1, 1914.

" — New Araliaceae from Mindanao —
Volume VII, article 110, page 2325, date of publication August 8, 1914.

" — Myrtaceae from Mount Urdaneta —
Volume VII, article 111, page 2343, date of publication August 11, 1914.

" — A Fascicle of North Agusan Figs —
Volume VII, article 112, page 2359, date of publication August 25, 1914.

ELMER, A. D. E. — Two Hundred Twenty Six New Species - I —
Volume VII, article 114, page 2543, date of publication March 27, 1915.

" — Two Hundred Twenty Six New Species - II
Volume VIII, article 115, page 2719, date of publication March 27, 1915.

" — Notes and Descriptions of Zingiberaceae —
Volume VIII, article 116, page 2885, date of publication August 25, 1915.

" — Zingiberaceae of the Sorsogon Peninsula —
Volume VIII, article 119, page 2963, date of publication May 31, 1919.

" — New Woody Plants from Mount Maquiling —
Volume VIII, article 121, page 3069, date of publication October 22, 1919.

" — New Plants from Mount Pinatubo —
Volume IX, article 126, page 3179, date of publication May 5, 1934.

" — New Urticaceae and Rubiaceae —
Volume IX, article 127, page 3227, date of publication June 14, 1934.

" — A Century of Philippine Meliaceae —
Volume IX, article 128, page 3273, date of publication May 1, 1937.

" — A Fascicle of Sorsogon Figs —
Volume IX, article 129, page 3397, date of publication November 25, 1937.

" — Glumaceae of the Irosin Valley —
Volume X, article 130, page 3507, date of publication March 15, 1938.

" — Notes on Asclepiadaceae —
Volume X, article 131, page 3543, date of publication May 1, 1938.

ELMER, A. D. E. — Irosin Freycinetia —
Volume X, article 132, page 3601, date of publication May 8, 1938.

" — Irosin Araceae —
Volume X, article 133, page 3611, date of publication May 18, 1938.

" — Irosin Schefflera —
Volume X, article 134, page 3637, date of publication May 28, 1938.

" — Irosin Melastomataceae —
Volume X, article 135, page 3649, date of publication May 15, 1939.

" — Miscellaneous New Species —
Volume X, article 136, page 3673, date of publication November 5, 1939.

" — Pandanus Utilissimus Elmer (Plate I) —
Volume X, article 137, page 3811, date of publication November 10, 1939.

FOXWORTHY, F. W. — Dipterocarpaceae from the Agusan Region —
Volume VI, article 97, page 1949, date of publication November 21, 1913.

HIERONYMUS, G. — Selaginellarum Species Philippinenses. a. cl. *A. D. E. Elmer* collectae quas determinavit et descripsit —
Volume VI, article 101, page 1987, date of publication December 20, 1913.

KRAUSE, K. — A New Tacca and Two New Raphidophorae—
Volume VI, article 106, page 2283, date of publication July 3, 1914.

KÜKENTHAL, G. — A New Carex —
Volume IV, article 64, page 1169, date of publication November 14, 1911.

MARTELLI, U. — Some Philippine Pandanaceae —
Volume III, article 60, page 1109, date of publication June 26, 1911.

MURRILL, WILLIAM A. — A Collection of Philippine Polypores —
Volume I, article 15, page 262, date of publication January 14, 1908.

PATOUILLARD, N. — Champignons des Philippines - I. Communiqués par *C. F. Baker* —
Volume VI, article 104, page 2239, date of publication June 6, 1914.

PRAIN, D. & BURKILL, I. H. — Dioscoreae Elmerianae. A contribution to our knowledge of the genus *Dioscorea* in the Philippine Islands —
Volume V, article 78, page 1589, date of publication May 5, 1913.

RADLKOFER, L. — Sapindaceae Philippinenses Novae - I —
Volume I, article 10, page 208, date of publication June 17, 1907.

" — Sapindaceae Philippinenses Novae - II —
Volume V, article 79, page 1601, date of publication May 25, 1913.

REHM, H. — Ascomycetes Philippinenses - IV. Communicati a clar. *C. F. Baker* —
Volume VI, article 96, page 1935, date of publication November 1, 1913.

" — Ascomycetes Philippinenses - V. Communicati a clar. *C. F. Baker* —
Volume VI, article 103, page 2191, date of publication May 20, 1914.

" — Ascomycetes Philippinenses - VI. Communicati a clar. *C. F. Baker* —
Volume VI, article 105, page 2257, date of publication June 27, 1914.

REHM, H. — Ascomycetes Philippinenses - VII. Communicati a clar. *C. F. Baker* —
Volume VIII, article 117, page 2921, date of publication December 29, 1915.

" — Ascomycetes Philippinenses - VIII. Communicati a clar. *C. F. Baker* —
Volume VIII, article 118, page 2935, date of publication January 14, 1916.

RIDLEY, HENRY N. — New Philippine Zingiberaceae —
Volume II, article 28, page 569, date of publication January 30, 1909.

" — Zingiberaceae from South Negros —
Volume II, article 31, page 603, date of publication March 9, 1909.

STAPF, OTTO — A New Trigonostemon —
Volume I, article 9, page 206, date of publication April 11, 1907.

STEPHANI, FRANZ — Three New Liverworts —
Volume II, article 18, page 385, date of publication September 25, 1908.

" — Six New Liverworts —
Volume VI, article 107, page 2287, date of publication July 3, 1914.

SYDOW, H. & P. — Notes and Descriptions of Philippine Fungi - I —
Volume IV, article 62, page 1153, date of publication October 10, 1911.

" — Fungi from the Island of Palawan —
Volume V, article 76, page 1533, date of publication May 20, 1912.

" — Notes and Descriptions of Philippine Fungi - II —
Volume VI, article 95, page 1919, date of publication October 25, 1913.

SYDOW, H. — Fungi from the Province of Sorsogon —
Volume IX, article 123, page 3113, date of publication April 20, 1925.

" — Parasitic Fungi from Mt. Pinatubo —
Volume IX, article 125, page 3173, date of publication April 20, 1934.

ZAHLBRUCKNER, A. — Lichenes Philippinenses —
Volume II, article 21, page 435, date of publication November 5, 1908.